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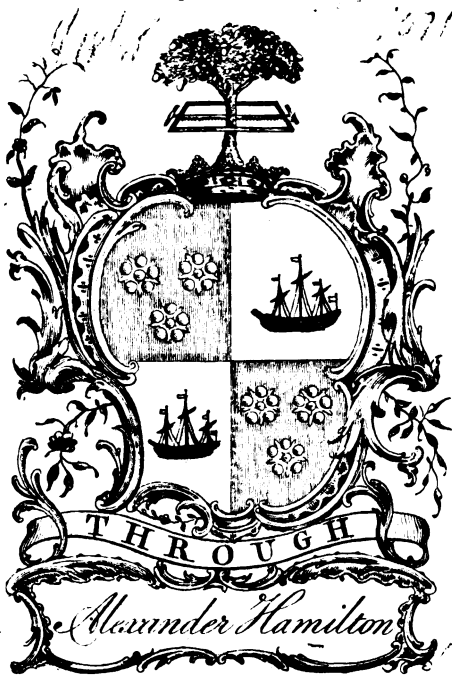
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EXPERIMENTS
IN
AGRICULTURE,

Made under the DIRECTION of

The RIGHT HONORABLE and HONORABLE
DUBLIN SOCIETY,

In the Year 1767.

And now Published at Their Request.

By MR. JOHN WYNN BAKER.

EXPERIMENTER in AGRICULTURE to the SOCIETY.

EV. 33

D U B L I N :

Printed by S. POWELL, for the AUTHOR.

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Advertisement,

To the R E A D E R.

IT is now approaching close upon five Years, since the Commencement of my Plan, for propagating a practical Knowledge of Agriculture in *Ireland*, by exhibiting Experiments in the Field. Since the Commencement of my Factory, for making all Kinds of Implements for Husbandry, it is near three Years; the latter Undertaking, being an unavoidable Consequence of the first; and though they have the Complexion of distinct Undertakings; yet, they are inseparable; for the Existence of the one, without the other, would render them both ineffectual; but whilst they stand united, I apprehend, Convenience and Information will arise to the Public.

For, if I am not too much flattered, by the Generosity of the Correspondents I have, in almost every County in the Kingdom, these Undertakings have been productive of many good Effects; particularly, in having introduced a better Culture, than has hitherto been practised, better Machines for the Execution of that Culture, and in the important Article of saving great Quantities of Seed in Sowing. Be-

Low-31 March, 1944. 2 vol.

ADVERTISEMENT,

sides which, Workmen, in many Parts I find, are animated, to imitate the Instruments which I have dispersed, abstracted from the Circumstance of many Men, who have worked with me, from Invitation, and other Causes, being now employed, in different Parts of the Kingdom; and although no two or three of them can make every Machine, which has been constructed in my Factory; yet, several of them can make many very good Ones, if their Want of Integrity shall not impose upon their Employers, as they have repeatedly upon me to my very great Loss.

But, that I may not be thought to arrogate to myself, the Merit of any Benefit, which may have arisen to the Cause of Agriculture, from my Undertakings; I request the Reader, will always recollect, that I consider myself, as no more, than the Agent or Machine, by which these Undertakings move; but that, the *Dublin Society* has been, and is, the main Spring and Pillar, which keeps the whole in Motion; and therefore to that *Society* is due, the Sense, which the Publick may retain, of the Utility of my Undertakings, not only for what they have done towards their Establishment, but that, because the very Existence of them, depends upon their Will and Pleasure. All the Merit I presume to claim is, that I have faithfully discharged the several Trusts they have been

To the R E A D E R.

been pleased to repose in me, to the utmost Exertion of my little Abilities, and with truly conscientious Integrity; and am most gratefully thankful to the Society, for their repeated and unanimous Resolutions to that Effect.

Here, I hope, it will not be considered as improper for me, to inform the Society, that in Consequence of that Patronage, which they have honoured me with for five Years past; they have stamped a Reputation upon my Name, not only in this, but the neighbouring Kingdom, and thereby have given such a Complexion of Stability to my Undertakings; that now, I am looked upon by the Publick, as a Person, to whom, under that Patronage, they have a Right to apply for Information, upon every Occasion, in which they want Assistance; and, consequently, my Time is much engaged, in answering the various Letters, and attending the personal Visitations of the Public.

And I flatter myself, that it will be considered, as no Reflection to our Undertakings or this Kingdom, that in all the new Publications, upon Agriculture in *England*, our Experiments are considered as not unworthy of such Notice, as I hope will afford some Satisfaction to the Friends of Agriculture in *Ireland*, at the same Time, that I consider myself, particularly obliged to the
late

ADVERTISEMENT,

late Writers, for the kind Manner, in which they have treated my Labors and Name, and assure them, that I shall always endeavour to deserve their Approbation.

How far, those who have applied, have been informed or satisfied with the Answers which I have given, I shall not presume to say ; but can only assure the Society and the Public, that I always have, and always shall, use my best Endeavours to give the fullest Information, in every Particular, that my Experience will admit of.

In this Character, during the past Year, I have received some anonymous Letters, suggesting different Methods of Improvement, and different Successions of Crops. I consider myself much obliged to every Person who may take the Trouble of suggesting new Hints to me, or of communicating their Thoughts upon Subjects of Improvement, which may come under their Consideration and Experience ; and above all, I am sure the Public will be obliged to such, for communicating their Experiments. But Gentlemen who write to me, without communicating their Names and Places of Abode, will please to consider, that hitherto, I have not communicated any Thing to the Public, in my annual Publications, which has not been well authenticated ; and that if any Scheme of Improvement, was to come to my Hand
from

from another ; with an Expectation of its having a Place in my annual Publications, that were I to publish it, I should, in some Degree, be answerable for its Credit ; but if it carried the Complexion of Novelty, it would have Prejudice to combat ; when I should be at a Loss to find its Author, to aid me in its Support : Under these Considerations, I flatter myself, I shall not incur the Censure of my anonymous Correspondents, for not giving a Place to any Paper of that Kind.

Not long since, Gentlemen who wish to serve the Public in this Way, had an Opportunity, of communicating their Observations, by Means of a monthly Publication in *London*, called the *Musæum Rusticum* ; but from a Fatality which will ever attend periodical Publications, that are tainted with Scurrility, and pened principally by Hirelings, this Paper soon expired.

But had it been supported by real Correspondents, there has not many Books appeared in my Time, which promised so much Advantage to the Public ; for there really would have been Pleasure and Emolument arising from such an Undertaking, properly executed ; we should have known what were the Pursuits of the Curious and Ingenious in Agriculture, in every Part of the three Kingdoms ; all conspiring, as if the Labor of one Man,

to

ADVERTISEMENT,

to the Benefit of the Public in general; and therefore I have wished to see it revived, but hitherto, it has not been attempted, that I have heard of.

The anonymous Letters, which I have received, has induced me to wish, something of that Kind to be attempted here, to be published once in three Months, (for oftner, I think would be too frequent) and, therefore, I mention it here, that Gentlemen, who are in the experimental Way, may consider of it; and if any shall think proper to communicate their Thoughts to me, upon any Subject of Agriculture, between this Time and *Michaelmas* 1769, I shall have great Pleasure in promoting a Scheme of this Kind; and if Matter sufficient can be collected, from *real Practical Correspondents*, during that Time, the Publick may expect the first Publication of a Paper, upon the Plan of the *Musæum Rusticum*, in *January* 1770, and so on, to be continued every three Months, so long as I find it will be supported. In the mean Time, I shall consult the proper Measures, for dispersing the same, through the principal Towns in the Kingdom, for the convenient Purchase of Gentlemen, who reside wholly in the Country, and in Proportion to the Demand; I should hope, so would be our Correspondents.

I have

I have lately discovered, that some Gentlemen have formed an Idea, that my Undertakings have been principally calculated to establish the Drill Husbandry in *Ireland*.

I shall beg Leave to remove that Idea, by reminding them, that the Introduction of the Drill Husbandry, is only one Branch of the general Plan; that we might be able, from real Practice, and repeated Crops, to find the Merit or Demerit of that Species of Culture, for the Information of the Public; and as the most effectual Method to discover the Truth, was to make comparative Experiments between that and the Common Husbandry, upon Ground equally prepared; that Practice has been pursued in the Course of my Experiments, in every Thing which I have yet experimented upon; and in some Articles in the Farmer's Department, that Husbandry has been found to excel the Common; but whether it will actually do so in Corn, by a Succession of Crops, yet remains to be determined, as nothing less than a Series of Experiments can inform us with Certainty.

By this Practice, fair Experiment is also given to the Common Husbandry, as appears by my Reports, under a Culture,
b
far

ADVERTISEMENT,

far exceeding that in common Practice, by the introducing better Machines than has hitherto been in Use, and thereby I hope, greatly improving what is understood to be the Common Husbandry.

It will also be considered, that if a Man engaged in such Undertakings as mine are, did not introduce in his Experiments, every Species of Husbandry, thereby to discover by Practice, which is to be preferred; that Information could not arise to the Public, which, I hope, my Experiments have afforded, and will yet afford. To establish or introduce the Drill Husbandry into general Practice, without regard to a judicious Practice of the Common, would have rendered Comparative Experiments unnecessary, because it would have been taken for granted that the Drill Culture is to be preferred. Though I have always had an high Opinion of it, yet I have dissuaded many from it, and never advised any Man to engage in it; but where Inclination has led Gentlemen to attempt it, the Nature of my Undertakings, required that I should give them all the Assistance in my Power.

If Gentlemen who may have contracted the Idea already mentioned, will please to look over my List of Instruments, they will find, full as much Attention has been given

To the R E A D E R.

xi

ven to the Improvement and Construction of Machines for the Common Husbandry, as there has for the Drill; as in an hundred or more Machines, which are named in my List, there are not above five or six for the Drill Culture.

And what seems to be a stronger Circumstance, than any other I can urge, that the Public have found Advantage in the Use of the Instruments for the Common Husbandry, is, that in a Sale of Machines, amounting to near two thousand Pounds, not above two hundred Pounds of that Sum has been for Implements for the Drill Husbandry.

INTRO-

T O

The RIGHT HONORABLE and HONORABLE

DUBLIN SOCIETY,

T H I S

R E P O R T

O F

EXPERIMENTS in AGRICULTURE,

IS GRATEFULLY INSCRIBED,

By their Faithful,

And most Devoted,

Humble Servant.

JOHN WYNN BAKER.

LAUGHLINSTOWN,
May 11, 1768.

A

INTRODUCTION.

On the 25th Day of *July*, 1765,

The RIGHT HONORABLE and HONORABLE

DUBLIN SOCIETY,

Were pleased to make the following
ORDER, *viz.*

“ **T**HAT it be recommended to Mr. *Baker*,
“ that with all convenient Speed, he will,
“ among his Experiments in Agriculture, al-
“ lot a Portion of Ground, (not less than one Acre)
“ for the Culture of Wheat in Drills, Horse-hoeing
“ the Intervals; and that he also allot another Portion
“ of Ground, (the same Quantity) for the Culture of
“ Wheat in broad Cast; that these two Portions of
“ Ground lie as contiguous to each other, and as much
“ of the same sort of Soil, as may be; that they be
“ both sown with the same Seed, and that Mr. *Baker*
“ report his Observations, resulting from this Experi-
“ ment to the Society.”

In my Report for the Year 1765, I informed the Society and the Publick, how far I had proceeded in this comparative Experiment between the Drill and Common Husbandry, in Obedience to the preceding Order,

And in my Report for the Year 1766, I furnished an Account of the Produce of Corn and Straw, from each Method of Culture, in the first Year in which the Experiment had been depending; and also stated every Article of Expence attending the two Methods of Culture, as it was incurred in the Practice, upon the given Quantity of Ground, in a clear and particular Manner.

I have already, in my former Reports, informed the Society, and the Publick, of the State and Quality of the Land devoted to this comparative Experiment, and how it had been treated before the Commencement of this Experiment.

By referring to my Report for the Year 1765, Page 48, it will appear, that the two Acres of Ground devoted to this Experiment, in the first Year, were sown with Wheat on the 5th of October, 1765. By the Report 1766, Page 17, it will appear, that the Acre devoted to the Drill Culture, was again sown with Wheat, on the 18th of October, 1766, with five Stone and two Pounds of Seed. And in Page 17, of the same Report, I mentioned, that I had in October, ploughed half the Acre, which is devoted to the Common Husbandry, in order to plough so much of it twice for Oats, and the Remainder to be sown with Oats after once ploughing, as is the Practice with the common Farmer.

In this I took the Sense of the Society, for Reasons which will appear by referring to my Report for the Year 1766, Page 16.

Thus this comparative Experiment has furnished a third, by which we can form a Judgment, whether
once

INTRODUCTION.

7

once or twice ploughing for Oats, be most profitable to the Farmer.

It now remains for me to report the result of the Continuation of this comparative Experiment for the *second Year*, and how far I have proceeded with it in the present, which is the third Year in which it has been depending.

Besides the Continuation of this Experiment, I have, extended these Kind of comparative Experiments much further ; for I have one Field of twenty Plantation Acres, half sown in Drills, and the Remainder in Broad Cast, with an Hope of giving as full Satisfaction as such an extensive Exhibition can convey to the Publick. And in all, I have above twenty Plantation Acres of Wheat in Drills, which is an Exhibition that hath given the highest Satisfaction to the many Gentlemen and Farmers, who have this Summer resorted to see it, from very many Parts of the Kingdom, in consequence of my having invited all Degrees of Men by public Advertisement ; a Ceremony, which I was sorry to find, many considered as necessary to their looking at my Labors ; but that such an Idea may not remain upon the Mind of any Man, I beg that every Friend to, and Admirer of Agriculture, will henceforth assure himself, that he will always be welcome to inspect my Experiments, or any other Branch of my Undertakings, so long as I may carry them on under the Patronage I am now honoured with, and all such Persons shall, at the Time of such Inspection, receive every Information which may be in my Power to give.

EXPERIMENTS

I N

AGRICULTURE.

COMPARATIVE EXPERIMENTS on WHEAT, between the DRILL and COMMON HUSBANDRY.

*The Continuation of a Comparative Experiment,
between the Drill and Common Husbandry.*

IT now remains for me to give an Account of the Operations upon the Drilled Acre of Wheat, and their Expence, with the Profit of that and the Oats sown upon the Acre of Land, which is devoted to the Common Husbandry.

After the Acre which is devoted to the Drill Culture had produced the Wheat Crop in the Harvest of the Year 1766, as mentioned in my Report for that Year, the same Acre of Ground, was again sown with Wheat in Drills, on the 18th of October following, with five Stone and two Pounds of Seed, for the Continuation of the comparative Experiment.

2d Crop of
Drilled
Wheat,
when sown.

Winter hoeing, when performed.

The Corn came up in due Time, and received the first or Winter Hoeing, on the 23d Day of November following, which cost One Shilling and Six Pence Halfpenny, including Horses, Plowman and Driver, as particularly specified in my former Reports.

The Manner of this Operation being performed, is described in my Report for the Year 1766, page 8, with some Observations, respecting the position of the Corn, &c. after this Hoeing, which are material to be attended to by every person who shall practise this Culture.

The Single Cultivator, when used.

The Spring Hoeing, with the single Cultivator, was performed on the 13th of March, and cost One Shilling and Three pence for the Acre. The manner of performing this Operation, and my Reasons for practising of it, appears in my Report for the Year 1766, page 9.

The Double Cultivator, when used.

Immediately after this, I introduced the double Cultivator, in the manner described in my Report for the Year 1766, page 10, which Operation cost Seven pence Halfpenny for the Acre.

Weeds, when removed.

The Weeds began to rise in May, to remove which, cost Eight pence for the Acre.

Summer Hoeing, when and how performed.

The Crop remained thus, until the 6th of June, when the Hoe Plough was again introduced, in the manner, and for the purpose described in my Report for the Year 1766, page 11, which Operation cost One Shilling and Four pence Halfpenny.

This was immediately followed by the double Cultivator, which finished the Culture of the Crop, and cost Eight pence Farthing. See Report for 1766, page 12.

The

The Crop remained thus, until the 20th of August, when it was reaped, to do which, took three Men. When the Drilled Wheat was reaped. The Wages of two of them were at Thirteen Pence a Day, and one of them at Ten Pence; consequently the Expence of reaping this Acre of Drilled Wheat, was Three Shillings.

The produce of Merchantable Wheat, was 5 Barrels, 12 Stones, and 7 pounds, and of Straw, 1 Ton, 9 Hundred, 2 Quarters, and 27 pounds. The produce of Wheat and Straw.

When this Corn was reaped, it was done by Mistake, for the Day before, Business called me from home; and that Morning I was speaking to one of my People, that this Acre of Corn would soon require to be cut, and when I came home in the Evening of the succeeding Day, I found he had cut it, because he said he understood I had directed him so to do. But the Corn should have stood a few Days longer, as it was not sufficiently ripe, which was some Injury to our Produce. Error in the Time of Reaping.

In our Calculation in the Field, upon the Number of Sheaves of Corn, it was apprehended, that our Produce would have been full seven Barrels, but when thrashed, I received no more than 5 Barrels, 12 Stone, and 7 pounds. How this Diminution upon our Field Calculation happened, I cannot ascertain, neither shall I trouble the Reader with my Suspicions, as I received no more, I must only state that Quantity.

I shall now state the Account of Profit and Loss upon this Experiment for the Year 1767, before I proceed to the Acre under the common Husbandry; and then state a comparative Account, of the Profit and Loss upon the two Methods of Culture, for the two Crops which we have had.

Dr.

Dr. One Acre of Wheat in Drills, as the
Expence arose in the 2d Year.

1766.

		<i>l.</i>	<i>s.</i>	<i>d.</i>
<i>Oct.</i> 16.	To ploughing once, after the Crop was reaped in the Year 1766, as mentioned in my Report for that Year	0	10	4
18.	To harrowing the Ground, with the drill Harrows	0	0	4½
	To drilling the Seed Corn	0	0	9
	To Seed Wheat five Stone and two Pounds, at 30 <i>s.</i> a Barrel, so charged, because the Crop of 1766, was sold at that Price, and so charged for the produce of the drill and common husbandry that Year	0	7	8
<i>Nov.</i> 23.	To the Winter Horse-hoeing	0	1	6½
1767.				
<i>Mar.</i> 13.	To the Spring-hoeing with the single Cultivator	0	1	3
	To do. with the double Cultivator,	0	0	7½
<i>April</i> 1.	To returning the Earth to the Corn with the Hoe-plow	0	1	6
<i>May</i> 13.	To Weeding	0	0	8
<i>June</i> 6.	To the Summer's Hoeing, still throwing Earth to the Corn	0	1	4½
	To deepening the Furrow, with the double Cultivator	0	0	8½
<i>Aug.</i> 20.	To reaping the Crop	0	3	0
<i>Sept.</i> 29.	To one Year's Rent	0	18	0
	To thrashing 5 Barrels, 12 Stone, 7 Pounds, at 8 <i>d.</i> a Barrel,	0	3	9
		2	11	6½
	To neat Profit upon the second Crop	5	11	5
		8	2	11½

Per

	<i>Per Contra.</i>	<i>Cr.</i>
1767.		
Sept. 29. By Wheat, 5 Barrels, 12 Stone, 7 Pounds,		
at 25 s. *	— —	7 0 7½
By Straw, 1 Ton, 9 Hundred, 2 Quarters,		
27 Pounds, at 9 d.	— —	1 2 3¾
		<hr/>
		8 2 11¼
		<hr/>

8 2 11¼

* It may not be improper, for the Information of some of my Readers, to say, that twenty Stone, fourteen Pounds to the Stone, make a Barrel of Wheat in *Ireland*.

Here

Reasons
why the
crop of 1767
is charged at
25 s. altho'
30 s. were
charged in
the Year
1766.

Here I must pray the Patience of the Reader, that I may exculpate myself from a Censure, which I may otherwise incur, from the Advocates of the Drill Culture; for high as my Opinion may be of its superior Advantages, when fairly compared with the common Husbandry; yet I cannot allow myself to make partial Representations, any more than I shall suffer my Opinion to be warped by any particular System; or by the arbitrary Declarations of any Man, beat out of a practice, which appears to be founded on rational Principles be the Business to be done, what it may.

Doubtless, it will be observed, that I have charged the Crop of the past Year obtained from the Drill Acre, at only 25 Shillings a Barrel, when it is pretty generally known, that I sold the Corn at 30 Shillings; and therefore it might with a good deal of Reason be said, that I ought to credit the Acre under the Drill Culture, for its Produce at that price, because I sold it so; and because I allowed the same for the Wheat, both of the Drill and common Husbandry, in my Report for the Year 1766.

But my Objections are these. When I charged 30 Shillings a Barrel in the Year 1766, the Corn of both the Experiments, would have fetched that Price in the Market, and had I demanded it, I could as easily have got 35 Shillings a Barrel for it for Seed, as I did 30; but 30 Shillings is the Price I have always sold my Seed Wheat at, and therefore I did not choose to charge it higher that Year, although the Market would have afforded the same Price. And notwithstanding I sold the Produce of my drilled Wheat in 1767 at 30 Shillings, yet, in the Market I should not have got more than 25 Shillings for it; and therefore, altho' it is a Diminution of the Profit, upon the face of the Account as already stated, yet I think no more ought to be allowed for the Produce of these Experiments, than the Market would afford (altho' by extraordinary Care, in the cleaning of it, which is seldom bestowed upon Market Corn, we can sell it higher for Seed, than the Baker can afford to give) for this manifest Reason, that
if

Comparative Experiments on Wheat, &c.

15

if all the Tillage Land of the Kingdom was under the Drill Culture, all the Produce could not be sold for Seed,

However, if these reasons shall not be sufficiently satisfactory, I shall just say, that if 30 Shillings be allowed, our Credit Side of the Account would be 9*l.* 1*1s.* 0*d.* $\frac{1}{2}$, instead of 8*l.* 2*s.* 11*d.* $\frac{1}{2}$, which would leave our neat Profit upon this Crop, 6*l.* 19*s.* 6*d.* $\frac{1}{2}$, instead of 5*l.* 11*s.* 5*d.* which makes a difference of 1*l.* 8*s.* 11*d.* $\frac{1}{2}$, upon the Acre.

In the Article of Straw, I have allowed only 9*d.* for every hundred Weight, because that was the Sum I allowed the first Year, but it is very well known, that Straw has been in the past Year from Six to Eight Shillings a Load, and if I had allowed the Market Price for the Straw, our Profit would have been from 20 to 30 Shillings more, upon this Acre of Ground. But the Business of selling Straw is such an intolerable Practice, that I am always concerned to see it in the Market; when on the other Hand, I feel no Remorse, at seeing it thrown and littered ever so carelessly about the Farmers Yard, for which purpose I consider it very well worth the Price I have charged, exclusive of the Market Expences, saved, in such Use of it; but the mistaken Love of Gain, betrays the poor Farmer, into the Sale of his Straw, when his Land is hungry, because the Straw is not consumed upon it.

Straw under rated.

Selling Straw injurious to the Farmer.

The

The Manner in which the Acre of Land devoted to the Common Husbandry in this Comparative Experiment was treated, for the Crop of Oats, and the Produce, after having produced the Wheat mentioned in my last Report.

Ground
twice
ploughed
for Oats.

In October, 1766, I ploughed half this Acre of Ground, in order to give it a second ploughing in the Spring for Oats, and the remaining half Acre was left under the Wheat Stubble, to be sown in the Spring with Oats also, at once ploughing.

And why.

My View in this was to ascertain by Experiment, whether once or twice ploughing for Oats be most profitable to the Farmer.—And in this Experiment I took the Sense of the Dublin Society, for Reasons which appear in my Report for the Year 1766, page 16.

When sown.

On the 27th Day of March, 1767, this Acre of Ground was sown with Oats under the Harrow, as is the general Practice, each half Acre having a Barrel of Seed, which is the Quantity usually allowed by the common Farmer, tho' sometimes more is sown.

The Corn came up very well, and was a very good Crop, as will appear by the Produce.

When reaped.

On the 7th Day of September the Oats were reaped, which took six Men, at 13 pence a Day each.

The Produce.

The half Acre which was twice ploughed, produced 7 Barrels, 11 Stone of Oats, and of Straw, 13 Hundred, 3 Quarters, and 7 pounds.

The half Acre which was ploughed but once, produced 6 Barrels, 9 Stone, and 7 pounds of Oats, and of Straw, 10 Hundred, 3 Quarters, and 24 pounds.

I shall

I shall now state an Account of Profit and Loss upon these Two Half Acres of Ground, independent of each other, in order to take the greater Produce in the comparative Account against the Drill Culture, as well as to compare the Experiment upon the once and twice ploughing for Oats.

Dr.

Dr. Half an Acre of Ground under Oats,
in the common Husbandry, twice
ploughed, according as the Expence
arose, in the 2d Year of the compara-
tive Experiments.

			<i>l.</i>	<i>s.</i>	<i>d.</i>
1766.					
<i>Oct.</i>	To the first ploughing	— —	0	5	2
1767.					
<i>Mar.</i>	26. To the second ploughing	— —	0	5	2
	27. To seed Oats one Barrel *	— —	0	10	0
	To the Seeds-man †	— —	0	0	6
	To the Harrowing, Horses and Driver	— —	0	2	3
			<hr/>	<hr/>	<hr/>
			1	3	1
<i>Sept.</i>	7. To reaping	— —	0	3	3
	To threshing 7 Barrels 11 Stone at 5 <i>d.</i>	— —	0	3	2 $\frac{3}{4}$
	To winnowing Ditto at 1 <i>d.</i>	— —	0	0	7 $\frac{3}{4}$
	To one Year's Rent at 18 Shillings	— —	0	9	0
			<hr/>	<hr/>	<hr/>
			1	19	2 $\frac{1}{2}$
	To neat Profit	— —	1	4	4
			<hr/>	<hr/>	<hr/>
			3	3	6 $\frac{1}{2}$

* When these Oats were sown, they were sold for 10
and 11 Shillings a Barrel.

† I pay this Man 12*d.* a Day.

Per.

Per Contra.

Cr.

		<i>l.</i>	<i>s.</i>	<i>d.</i>
1767.				
Sept. 7.	By Produce of Oats, 7 Barrels, 11 Stone, at 6 <i>s.</i> 10 <i>d.</i> *	2	13	2 $\frac{1}{4}$
	By Produce of Straw, 13 Hundred, 3 Quarters, 7 Pounds, at 9 <i>d.</i>	0	10	4 $\frac{1}{4}$
		<hr/>		
		3	3	6 $\frac{1}{2}$
		<hr/>		

* I sold these Oats at 6*s.* 10*d.* a Barrel, which was a good Price, for the Year,

B

Dr.

Dr. Half an Acre of Ground under Oats in the Common Husbandry, once ploughed, according as the Expence arose, in the second Year of the Comparative Experiment.

			<i>l.</i>	<i>s.</i>	<i>d.</i>
1767.					
Mar. 26.	To ploughing once,	_____	0	5	2
27.	To feed Oats, one Barrel,	_____	0	10	0
	To the Seedfman,	_____	0	0	6
	To the Harrowing, Horses, and Driver,	_____	0	2	3
			<hr/>		
			0	17	11
Sept. 7.	To reaping,	_____	0	3	3
	To thrashing 6 Barrels, 9 Stone, 7 Pounds,	_____			
	at 5 <i>d.</i>	_____	0	2	10
	To winnowing ditto, at 1 <i>d.</i>	_____	0	0	6 $\frac{1}{4}$
	To one Year's Rent, at 18 Shillings,	_____	0	9	0
			<hr/>		
			1	13	6 $\frac{1}{4}$
	To neat Profit,	_____	1	0	3 $\frac{1}{2}$
			<hr/>		
			2	13	10 $\frac{1}{4}$
			<hr/>		

Cr.

*Per Contra.**Cr.*

		<i>l.</i>	<i>s.</i>	<i>d.</i>
1767.				
Sept. 7.	By Produce of Oats, 6 Barrels,* 9 Stone, 7 Pounds, at 6s. 10d.	2	5	7½
	By Straw, 10 Hundred, 3 Quarters, 24 Pounds, at 9d.	0	8	2¼
		<hr/>		
		2	13	10¼
		<hr/>		

* Fourteen Stone, fourteen Pounds to the Stone, make a Barrel of Oats in *Ireland*.

B 2

Thus

The Advantage of twice ploughing for Oats proved.

Thus we see, that twice ploughing for Oats, fully answers the Expence, because we have, after paying that additional Expence, a superior Profit upon the half Acre twice ploughed, of four Shillings and an Half-penny, and consequently eight Shillings and one Penny upon an Acre.

The Farmer's Objection.

However, although this appears to be an Advantage worthy the Farmer's Attention, because eight Shillings additional Profit upon an Acre of Ground, will help greatly towards his Rent ; yet, upon Land, which is inclinable to throw up Grass, the Farmer will argue, and I think not without Reason, that he gains that Profit by his Cattle pasturing from his Wheat Harvest, until Spring upon the Wheat Stubble.

An Impediment to twice ploughing for Oats too general.

And it too generally is the Case, that almost every Occupier of Land, undertaking too much for his Capital, and Strength of Cattle, he cannot plough his Wheat Stubbles in Autumn, for his succeeding Crop of Oats, even where the Ground will not afford him an adequate Profit by the Grass which might otherwise rise, if the Land were good.

In what Cases twice ploughing should not be omitted.

But where the Intention of the Occupier shall be to lay down his Ground, either with Clover, or for Meadow ; I earnestly recommend that he plough the Wheat Stubble in Autumn, although the Ground should be inclinable to Grass ; and if possible, plough and harrow it twice in the Spring for sowing, for which the Spring Crop will abundantly pay ; besides which, he will find great Benefit from it in his Grass, be it of what Kind it may ; for Grass Seeds, as well as Corn, flourish the better, for the Ground being well reduced at the Time of sowing.

And in Order to support this by Experiment, as well as to ascertain how far the Drill Culture improves Ground.

The Method of treating

I have a field, now under a Crop of Drilled Wheat, which is the fifth Drilled Crop in Succession,
upon

upon the same Ground. And, in Order to compleat the Process, and thereby to shew that this Culture does not impoverish Ground, like the Common Husbandry, I intend to lay this Field down for Meadow next Spring. And to compleat it properly, I intend to plough it very deep, as soon as the present Crop comes off, Water cut it as carefully as if it were under Corn, that it may lie dry during the Winter, and to plough and harrow it twice in the succeeding Spring, for Oats and Grass Seeds, by which I shall expect excellent Meadow, although it is not grassy Land in nature. See my Report for the Year 1764, Page 2 to 13, where it will be found how this Field was treated; and for the Quality of the Land, see the same Report, Page 39, 40, 41.

Land which
is to be laid
down for
Meadow.

In order to carry on our Comparative Account of Profit and Loss, between the Drill and Common Husbandry of the two Acres in question, I am now to compare the Produce of Oats already mentioned, with the Produce of Drilled Wheat for the past Year.

From what I have already said, respecting the Objections and common Impediments to the twice ploughing for Oats, it is more than probable, that the Practice will not, and in many Cases cannot be adopted. But notwithstanding that, I shall, (in order to give the Common Husbandry every Advantage, as I have always done before, in the Course of this comparative Experiment) first take that Method in my comparative Account against the Drill Culture, as producing the greater Crop, and consequently the most Money.

We have already seen, that our *half Acre* of Ground under Oats, which was twice ploughed, cost one Pound nineteen Shillings and two Pence half-penny, and produced three Pounds three Shillings and six Pence half-penny, which we must now double, for our comparative Account, in order to have Acre against Acre, which will make our comparative Experiment stand as follows, for the past Year.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
To neat Profit upon an Acre of Drilled Wheat in the second Year, ———	5	11	5
To neat Profit upon the Oat Crop of the common Husbandry, in the second Year of the Experiment, ———	2	18	8
Superior Profit in Favour of the Drill Culture	2	12	9

In stating the preceding comparative Account, the warmest Advocates for the Common Husbandry, must admit, that I have given that Husbandry great Advantage, by taking the Crop which was obtained from twice ploughing the Ground for Oats against the Drilled. But now let us examine the Matter in another Way.

We have seen the two Experiments upon the Acre of Ground for Oats distinctly stated. I shall now state them together, as one Crop, and compare that with the Produce of the Drilled Acre.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
Half an Acre under Oats, twice ploughed, produced a neat Profit of ———	1	4	4
Half an Acre under ditto, once ploughed, produced, ——— ———	1	0	3½
	2	4	7½

If we compare this Sum with our Profit upon the Drilled Acre, the superior Profit of that will be three Pounds six Shillings and nine Pence half-penny, instead of two Pounds twelve Shillings and nine Pence, as already stated.

But what seems to be yet a fairer Comparison, if we adhere strictly to the Practice of the Common Husbandry is, to suppose the whole Acre devoted to that Culture in this Experiment, had been but once ploughed

ploughed for the Oats, which, in that Case, would stand thus.

The Acre of Ground devoted to the Common Husbandry, sown with Oats in 1767, after once ploughing the Ground, after having produced Wheat in the Year 1766, afforded a Profit of two Pounds and seven Pence, as already stated, Page 20. Out of the Profit arising from the second Crop of Drilled Wheat, as already stated in Page 12; viz. five Pounds eleven Shillings and five Pence, we are to deduct this two Pounds and seven Pence, which will leave a superior Profit, in Favour of the Drill Culture for the second Year of three Pounds ten Shillings and ten Pence, instead of two Pounds twelve Shillings and nine Pence, as already stated, in Page 24.

For the clearer Information, as well as Choice of the *candid* Reader, I shall now state the comparative Account for the two past Years, in two different Ways. The first, by giving the Common Husbandry the Advantage of twice ploughing for Oats; and the second, supposing the Ground to be ploughed but once, as is the common Practice.

Dr. One Acre of Ground, under the common Husbandry, for two Years, as the expence arose, the Ground being twice ploughed for the Crop of Oats.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
1766. <i>Sept.</i> 29. To the Expence upon an Acre of Wheat, as stated in my Report, 1766, p. 22.*	4	1	8
1767. <i>Sept.</i> 29. To the Expence upon an Acre of Oats, upon the same Acre of Ground, which produced the above, the same having been twice ploughed for the Oats † —	3	18	5
	<hr/>		
	8	0	1
To clear Profit in two Years —	16	9	10
	<hr/>		
	24	9	11
	<hr/>		

* The Reader will recollect, that this Wheat Crop, was not charged with a Year's Rent for fallowing, nor with the Expence of making a Fallow, and for the many other Advantages given to it, in this comparative Experiment, I refer him to my Report for the Year 1766.

† See Page 15,—where the Account is only stated for Half an Acre, but in stating this comparative Account we must suppose the whole Acre to have been twice ploughed, and therefore we must double the Expence, as on the Credit Side, I have the produce.

Per

Per Contra.

Cr.

		<i>l.</i>	<i>s.</i>	<i>d.</i>
1766.				
Sept. 29.	By the Produce, see my Report for the Year 1766, Page 23	18	2	10
1767.				
Sept. 29.	By the Produce, as stated in Page 18, with this Difference, that in stating this Account we must double the Sum, as our Calculation is for an Acre, instead of Half an Acre.	6	7	1
		24	9	11

Dr.

Dr. One Acre of Ground, under the common Husbandry for two Years, as the Expence arose, the Ground being once ploughed for the Crop of Oats.

		<i>l.</i>	<i>s.</i>	<i>d.</i>
1766.				
Sept. 29.	To the Expence upon an Acre of Wheat, as stated in my Report for the Year 1766, Page 22, ———	4	1	8
1767.				
Sept. 29.	To the Expence upon an Acre of Oats, upon the same Ground, which produced the above Crop, the Ground being but once ploughed, see Page 20, ———	3	7	1½
		7	8	9½
To clear Profit in two Years	——	16	1	9
		23	10	6½

Dr. One Acre of Ground under Wheat in Drills for two Years.

		<i>l.</i>	<i>s.</i>	<i>d.</i>
1766.				
Sept. 29.	To the Expence upon an Acre of drilled Wheat, as it arose in the first Year, and stated at large in my Report for the Year 1766, Page 20, ———	3	5	1¾
1767.				
Sept. 29.	To ditto on the second Crop, see Page 12, ———	2	11	6¼
		5	16	8
To clear Profit in two Years	——	15	2	10¾
		20	19	6¼

Per

Per Contra.

Cr.

			<i>l.</i>	<i>s.</i>	<i>d.</i>
1766.	By Produce, see my Report for the Year				
Sept. 29.	1766, P. 23, ——— ———		18	2	10
1767.	By the Produce, as stated in P. 21, which				
Sept. 29.	must be doubled for the same Reason as				
	it is on the other Side — ———		5	7	8½
			<u>23</u>	<u>10</u>	<u>6½</u>

Per Contra.

Cr.

1766.	By the Produce, see Report 1766, P. 21,		12	16	7
Sept. 29.					
1767.	By Ditto, see P. 12, ——— ———		8	2	11½
Sept. 29.			<u>20</u>	<u>19</u>	<u>6½</u>

Thus

Thus it appears, that if we take the Account, in which the Acre under the common Husbandry is supposed to have been twice ploughed for Oats, that in the two Years, that Culture exceeds the Drill in Point of Profit, £. 1 6 11 $\frac{3}{4}$: But if we take the Account, in which the Ground is supposed to have been ploughed but once, in that Case, the common Husbandry, for the two first Years, exceeds the Drill, in Point of Profit, only 18 Shillings and 10 Pence three Farthings. But if we value the second drilled Crop, at what it really sold for, *i. e.* 30 Shillings a Barrel, instead of 25 Shillings, in that Case, the drill Husbandry will afford the larger Profit, by 16 Shillings and 9 Pence Farthing, altho' we take the larger Profit of the common Husbandry against the Drill, notwithstanding the many other advantages which have been given to the former, in the Course of this Experiment.

The drilled Acre was again sown with Wheat, for the third Year, in *October*, 1767, and is the 5th drilled Crop upon the same Ground, without Intermision*.

In this Place, I shall just beg Leave to inform the Society, that as some People might imagine, so small a comparative Experiment as two Acres not a sufficient Trial of the Merit of the drill Husbandry; and whereas a Story has been very basely propagated, that I had highly manured the drilled Acre, and had not manured that under the common Husbandry at all, see the Preface to my Report 1766, Page 3, where that Falshood is confuted.

In order fully to answer the Expectations of the Society, I have far exceeded their Order of the 25th of *July*, 1765, for I have sown a Field of 20 Plantation Acres, half under the common Husbandry,

* In the Year 1764 Turnips, 1765 Barley, 1766, 1767 and 1768 Wheat.

dry, and the other half in Drills, corresponding with the above Order in every Respect, except that of exceeding the Request of the Society, by 18 Acres; and upon this 20 Acres of Ground I used no Manure at all of any Kind, neither does any Man of the Neighbourhood, that I can learn, remember any Manure ever being put upon this Field; and I have had it under a common Course of Tillage for five Years, and I am told it has been under Tillage for 60 Years.

The Corn under both Methods of Culture is allowed by all Persons who come to see it, to be the best they have seen this Year.—

In another Field, which is the 5th drilled Crop in Succession upon the same Ground, I have sown three Species of Wheat, in order to ascertain by Experiment, which is the most profitable Corn for the Farmer to propagate: And in the sowing this Field, I did not divide the Ground into three Parts; but I began on one Side the Field, and finished on the other, by sowing with the first Sort every third Ridge, and in like Manner I sowed the two other Kinds, so that the three Species of Corn stand in alternate Rows through the Field.

I have also, in another Field, sown six Kinds of Turneps in the same Way, giving each Kind an equal Chance of Ground in Point of Quality.

These are some of the Experiments which I have depending this Year, of which I shall give an Account next Spring.

Some

Some Account of a Fly which attacked the Wheat in the Year 1767, the Manner in which it injured the Corn, how the Insect disappeared, and its destructive Progress interrupted.

The Fly,
when first
seen.

In the Month of July, 1767, I was walking with a Gentleman in my Fields who came to see my Corn, &c. to whose Speculation and Ingenuity I am obliged for the Discovery of a Species of Fly, which was at that Time preying upon the Grains of Wheat.

The Destruction which these Insects made in the Corn, induced me to be very attentive to them for a Fortnight, during which Time they increased exceedingly, and so in Proportion the Corn suffered, in every Field I had that Year.

My Wheat of the Year 1767 was injured by small Flies; and I had that Year above eighty Plantation Acres.

The Fly described.

These Flies are of a very small Kind, about $\frac{1}{16}$ th of an Inch long, but their Diameter so small, that it is not easily ascertained; I suppose scarcely $\frac{1}{16}$ th of an Inch: Their Wings are Black, and their Bodies of a lighter Colour.

How they
destroy the
Wheat.

They make their Way without any apparent Wound in the Hull, or Chest which contains the Wheat, and post themselves next the Grain, within the Hull.

They perforate and consume the Grain, whilst in its sappy or milky State; and in its Place deposit their Maggots, which are shielded by the Hull from external Injury, until their Generation is completed, and in Proportion as the Weather is warm and dry, so they increase and multiply exceedingly.

The

The certain Indication of the Corn being damaged by them is, that the Ears, in Part, will look Yellow, when other Parts of the same Ears will look Green ; where the former Complexion appears, let the Hulls be opened by touching the Points carefully, without breaking them off, and not only the Flies will be seen, but the Maggots will be found where the Grain had been, in a little Cluster, and of a pale yellow Complexion.

The Indication of their having damaged the Wheat.

When the Day is warm, dry, and calm, by looking attentively, an infinite Number of the Flies will be seen upon the Ears of Corn, and upon the Stems of the Ears to which the Hulls are united ; but more upon the latter than upon the former, for Nature seems to direct these Insects to be very careful how they expose themselves ; for during the Fortnight in which I gave very close and daily Attention to them, it was very seldom that I could discover any of them to venture a Passage upon the Wing from one Ear of Corn to another, tho' doubtless many of them did ; but they are so small that they pass imperceptibly, unless the human Sight approaches them very nearly.

Warm dry Weather gives them Vigor.

Happily for Mankind these Flies cannot survive heavy Rain ; for in a Fortnight after I first saw them we had Rain, which totally destroyed them, at least for what I could see, for I saw them no more that Summer.

Rain destroys them.

I apprehend, the Position they place themselves and their Maggots in, renders them very liable to Destruction by Rain, for the Chests, or Hulls, covering the Grains of Corn, will hold a certain Quantity of Water like a Cup, and I conclude the Flies and Maggots therein perish by drowning : And the Flies, which are on the Outside, seeking Admission into other Ears of Corn, are beat down and destroyed by the falling Rain, as Bees frequently are in their Passage Home to their Hives.

And how.

An

An Experiment on the sowing Oats to stand the Winter, compared with sowing the same Corn in the Spring ; and some other comparative Experiments on different Kinds of the same Grain, under different Methods of Culture.

Much has been said in the Recommendation of the sowing Oats in the Month of *October*, to stand the Winter ; and as my Undertakings are calculated for the Information of the Publick, I considered this as an Experiment which I ought to attempt ; particularly, as some Gentlemen requested I would, altho' I was at the same Time fully assured of the Impossibility of its being carried into general Practice, for Reasons which I shall offer presently.

In the Month of *October* I sowed with the Drill Plough half an Acre of one of the Fields mentioned in my Report for the Year 1764,* with a Species of Oats which I shall describe presently : 'The Corn came up extremely well, and had a very fine Colour, with great Luxuriance, until the Month of *January*, when we had a pretty smart Frost, which continued for some Time.

This Frost affected the Oats exceedingly, for the Plants turned quite Yellow, looked as if they had been singed with an hot Iron, and appeared as if they were dying.

The Frost was followed by Snow, which lay some Time upon the Ground ; and this was succeeded by Rain. When the Snow disappeared, I really imagined my Oats were in a Manner destroyed, for they had lost the fine and rich Appearance which they made before the severe Weather, and now were very thin
in

* And is the same Field mentioned in Page 22, and Page 31, in this Report, to be now under the 5th drilled Crop.

in every Part, but particularly where the Water lay most.

This gave me but an unfavourable Opinion of this Attempt ; however I let them remain, and as soon as the Ground was dry enough to admit the Horse Hoe, I introduced it, and gave this Corn the Spring-hoeing.

Soon after, the Plants which remained alive, shot up surprizingly, and really were of such a Size as I had never seen before ; they were more like green Reeds than Oats, and, until the Corn shewed itself, every Person who saw it, were at a Loss to pronounce what it was, for the Stems were much stronger than Wheat, which it was imagined to be until after it had shot.

In the same Field, I sowed in the Spring, the same Quantity of Ground in Drills with the same Kind of Oats : And also, the same Quantity of Ground with the common white Oats in Drills likewise ; and the same Quantity of Ground in the Broad-cast or common Way, with the common Oats.

The Purpose of these Experiments was calculated to compare the different Species of Corn, the Winter and Spring sowing, and the different Methods of Culture.

I have so fully described the different Operations in the drill Culture, in a former Publication, that I need not here say more, than, that all the Experiments in Drills received three Horse hoeings except the Winter Oats, and that Experiment received a Winter hoeing, exclusive of the Spring and Summer hoeings.

Respecting the Winter Oats, such as had perished were not to be recovered, but such as survived the Severity of the Winter flourished much beyond my Expectations, and were ripe three Weeks sooner than my Spring Oats which were sown in the same Field.

The Corn was such as I had never seen before, the Grain was large and heavy, more like Bere than Oats,
C and

and the Produce was 3 Barrels 11 Stones and 6 Pounds.

Had not the Crop suffered by the Frost, Snow and Rain of the Winter, in the Manner already described, and the natural Wetness of the Land, the Crop must have been much greater; but even at what it did produce (which we see was at the Rate of 11 Barrels 8 Stones and 12 Pounds to the Acre) I think it a good Crop, abstracted from the Circumstance of the Corn being so much better in Point of Quality, than any Spring sown Oats can be.

How much this Corn would have produced in the Market more than Spring sown Corn I cannot say, because I gave it all away for Seed to Gentlemen who saw and admired it.

The half Acre which was sown in the Spring in Drills, with the same Sort of Corn, produced 5 Barrels 12 Stones and 10 Pounds, which was at the Rate of 11 Barrels 11 Stones and 6 Pounds to the Acre.

The half Acre sown in the Spring in Drills, with the common white Oats, produced 5 Barrels 10 Stones and 12 Pounds, which was at the Rate of 11 Barrels 7 Stones and 10 Pounds to the Acre.*

And the Half Acre which was sown in the common Way, with the common Oats, produced 6 Barrels 1 Stone and 3 Pounds, which was at the Rate of 12 Barrels 2 Stones and 6 Pounds to the Acre.

Thus we see that the fat Oats, sown in *October*, was little inferior in Point of Produce (altho' they suffered much as hath been mentioned) to the same Oats, sown in the same Manner in the Spring, and was much better Corn: And we see that the fat Oats produced more than the common Oats sown in the same

* This Crop is something short of Mr. *Lewings's*, which is particularly related in my Report for the Year 1765, p. 72.
Way;

Way; but that the common Oats, sown in the common Way, produced something more than any which was sown in Drills; which still confirms what has appeared by our former Experiments, *viz.* that upon Ground equally prepared the common Husbandry will produce the most Corn for *one Crop*. And I hope the Reader will please to remember, that I have never taught him to expect as great a Produce from the drill Culture as from the common Husbandry, *for one Crop*, where the Ground shall have been *equally prepared*: But the Advantage arising to the Tiller of Land in the drill Husbandry, we are taught to expect, will arise from the *Succession* of Crops upon the same Ground, by the *Cheapness* of the Culture.

And as some Support thereof, here it may not be improper to inform the Reader, that the Field which was devoted to this Set of Experiments has been under a Succession of drilled Crops, ever since the Year 1764, and is now under drilled Wheat, as mentioned in Page 32, where I describe three Species of Wheat to be sown in alternate Rows: But the Part of this Field which was sown with Oats, in the common Way, is under Grass, as that could not be restored to the drill Culture without a Year's Preparation.

*Some Account of, and Observations upon, the
Oats already mentioned under the Name of
FAT OATS.*

This Species of Corn, from what I can collect, has not been long in this Kingdom; for I am informed that a Gentleman near *Kells* found a few Grains of it in a Barrel of Foreign Flax Seed, which he bought in *Dublin* a few Years ago. From the extraordinary Size of the Grain he was induced, by a laudable Spirit of serving the Publick, to cultivate those few Grains carefully in his Garden, and from thence he introduced them into the Field, until he possessed himself of such a Quantity as to dispose of them to others; so that now, from one Hand to another, they are in the

Possession of many Gentlemen and Farmers, in the Counties of *Meath* and *Kildare*, and in many distant Parts of the Kingdom, to whom I have sent them.

How they came by the Name of Fat Oats I cannot say, unless they have been so called from their great Size.

I am sorry that my Experience of these Oats, will not admit of my recommending them to the Culture of the Farmer; but the Objections which have arisen in my Experience of them, are as follow,

The Skins of them are very thick, and what is still worse, I found, upon closely examining the Grains, that there is a small Grain, almost enveloped by the large one, which greatly contributes to their Quantity of Hulls, and Diminution of Meal, when they come to the important Experiment of Drying and Grinding, for the Purpose of making Oatmeal.

For I sent three Barrels of these Oats, of the Spring Crop, and the like Quantity of common Oats, which were also raised in the Drill Way, from the Spring sowing, to the Mill, in the Charge of a careful man, and when the Meal was obtained from each Kind, through the same Sieve, the common Oats yielded rather more than the fat Oats.

But even this Experiment, if there were no other Objections, should not discourage the sowing these Oats, because, if the Crop with any Certainty could be saved, the Increase would be incredible, and therefore would abundantly answer in point of Profit; but the great misfortune is, that if they stand until they are properly ripe, the Cultivator may lose the greater Part of his Crop, by a sudden Squall of Wind; and at last, if he escapes that Accident, they will shed extravagantly in the reaping, binding, gathering, drawing, pitching, ricking, &c. So that by the time they come to the Hand of the Tresher, an infinite deal of the Corn is lost.

With

With an hope of obviating this Inconvenience, I reaped some of mine, which grēw in another Field, before they were thorough ripe, but I found that did not answer; for when they had lain upon the Ledges to dry and ripen, they shed even then, and besides that, the Grain was poorer; and if, after cutting them in this State, they are not suffered to lie long enough upon the Ledges, to wither the Straw and harden the Corn, the former will heat when stacked, to the great Injury of the Grain.

Another great Inconvenience which attends this Species of Corn, is, that it seldom ripens together, for some of it will be green, when other Parts of it, immediately joining, will be so ripe as to shed.

And what seems to render it a Kind of Corn not fit for the poorer Sort of common Farmers, is, that it requires rich Ground and good Tillage; the former few are possessed of, and the latter much fewer practice.

But when good Ground, sufficient Tillage, and a command of Hands in the Hour of Harvest, are in the Power of the Farmer, accompanied with Care in handling the Corn, (in the many tedious Times in which it is to pass the Hand, before its Value can come to the Pocket of an anxious Slave of the Country, to answer the Call of his Landlord, and the many other Demands which are upon him) in that Case, the Crop will be very great.

But I have experienced such extravagant Waste attends the Cultivation of this Species of Corn, that I have disposed of all I had of it, and if I do not change my Mind, I shall never sow it again.

At the same Time I must admit, that the Corn is very inviting to any Man to cultivate, upon seeing and handling of it; and if any Method could be contrived to save it without shedding, I am persuaded the Produce would be greater than any other Species of Oats can afford, that I have seen.

But there is yet another Objection to this Species of Oats, which arises in the Straw, for that makes very indifferent Fodder for Cattle in the Winter.—It is Brittle, Dusty, and Dry, which I apprehend arises from the Heat, which comes upon it, on Account of some of the Straw being unavoidably Green, when the Corn is cut.

Considerations upon the sowing Oats to stand the Winter.

From the Experiment already related, we see that better Oats are obtained, by sowing them as a Winter, than there can in sowing them as a Spring Crop; but we see, that they suffer by Frost, Snow, and Rain, in the Winter. I think it is very probable, that if the Ground be a warm and dry Soil, they will suffer much less.

But I do conceive, besides that of the Land being dry, it should also be rich; and I am willing to believe, that if, in the Months of November and December, Sheep were turned into the Field, and suffered to graze the Oats close to the Ground, that it might be a Means of preserving the Roots greatly, from the Injury they sustain from the Frost, Snow, and cold Rains of the Winter, which generally commence in this Kingdom, in the Months of January and February.

My Reason for supposing that grazing the Corn will contribute to its Preservation, is, that I apprehend when the Blades of the Corn are destroyed by the Severity of the Weather, as already mentioned, that as Putrefaction comes upon them, they communicate the same Disease to the Roots, and from thence, as I conceive, we sustain the Diminution of our Plants, as already mentioned.

Now, what is the End proposed in sowing Oats as a Winter Grain? The Answer will be, in Order to obtain better, and more Corn, and that earlier than the Spring Sowing will afford.

It

It seems necessary to enquire, why the Winter sowing should have those Effects.

Plants, in Proportion to their Age, send out Roots, and in Proportion to the Number of those Roots, more or less Food is brought Home, for the Sustainance of the Trunk or Body of the Plant, and its dependant Parts, be it of what Kind it may; the Quantity of that Food, and Quality in Point of Crudeness, being always governed by the Texture, or Pores of the Plant.*

The Oats then, being sown five or six Months before the usual Time, have Leisure to take firm Possession of the Ground by the Roots, before the severe Weather comes on which appears to affect them most. Such of the Plants as survive that Severity, having already got firm Possession of the Soil, begin to move in Vegetation as early in the Spring as the Season will admit of, whilst the Spring Oats are not yet, perhaps, committed to the Ground; but in this early Effort to vegetate, we do not find that it is the Autumn Growth which is shooting forward, but that it is New and Spring shoots, which are rising from the surviving Roots, whilst those of the Autumn Growth are decayed and decaying.

I submit then, upon these Considerations, whether it does not seem to promise Preservation to the Roots, if we turn Sheep on to eat the Blades which shoot up before the severe Weather comes on, rather than let them perish, whilst in contact with the Roots, which, as I before said, I do apprehend communicates Putre-

* The Oak, although much stronger, yet, from its firm Texture and small Pores, takes much more delicate Food, than the Sally; and, therefore, the latter grows much faster than the former.—The Manner of Plants feeding, and what is their Food, is a Point which has been much controverted; and, therefore, I mean not to enter upon that Subject, unless I shall live to publish a systematical Work, in which Case I shall, without Dread of the learned in Scientific Principles, (because I am sure, they will read and judge impartially) give my Sentiments upon Principles not yet attempted.

faction to the Roots, and by which I incline to believe they perish.

But let it be remembered, that I form this Judgement from the Experiment I made, which was upon Ground apt to retain the Wet of the Winter, as most of my Land does; and therefore more susceptible of Frost than dry Land can be, for Reasons so obvious that I need not describe them; and therefore my Winter Oats must have suffered more than I think it is probable they will, when sown upon Land naturally dry, unless *hard Frost immediately follows very heavy Rain.*

If any Man who shall sow Oats as a Winter Corn, should put in Practice what I have suggested, of pasturing the Oats with Sheep, I beg to be understood, that I mean the Sheep to be turned on, when the Land is dry, and on no Account when it is wet.

Wheat and Oats are the two capital Grains for the Sustenance of Man and Beast; the rest may be classed in the Tribe of Luxuries, at least from the human Manufacture and Use of them.

Of a Piece with His other innumerable Indulgences to the Animal Creation, how wisely and how kindly has our Creator, adapted the Culture of these two capital Species of Corn, to the Convenience, and to the Power of Men!

For the sowing of Wheat, He has given us an whole Year to prepare the Land, and allowed us a Season of two Months for committing it to the Ground; and that this might not be interrupted by Oats; *the inferior Grain.* He has as generously to us, created them in such a Manner, that they are to be sown in the Spring, and six Months perfects their Generation, so that they become Food fit for Man and Beast.

Human Invention has thought of subverting this Order, by sowing Oats as a Winter Grain; and we find, where the Corn survives the Winter, that it produces

duces finer and better Corn, than when sown in the Spring; but notwithstanding that, I am apprehensive it will be found a precarious Culture at best: Besides which, it can never come into an extensive Practice much less a general one; for in the Course of my Observations, I have generally seen that the Farmer, particularly in this Kingdom, always has enough to do, to get his Wheat into the Ground, without thinking of sowing his Oats in the Wheat sowing Season.

And further, as soon as ever his Wheat is sown, he ought to be breaking his Fallows, for his next Wheat Crops; but it too generally is the Case, that his poor, little, half-starved Cattle, are over-wrought by the Wheat sowing, and his Fallows remain unbroken, until after his Spring Corn is sown; hence his Wheat Crops are miserable, and he remains in Poverty.

Where a Gentleman or Farmer, chuses to have a few extraordinary good Oats, for any favourite Cattle, and that he has Ground suited to the Purpose, and every other Convenience, in such Case a few Acres may be sown, with some Hopes of Success; great Care being taken to let off the falling Rains of the Winter, by carefully Water-cutting the Land.

I have dwelt longer upon the Subject of Oats than I intended, when I entered upon it, and I hope the Reader will indulge me a little further, in behalf of the poor Cottager, commonly called Cotters here, who, according to the Custom of this Kingdom, are engaged to their Master for the whole Year, at certain Wages, be the Hire of additional or supernumerary Men what it may. From the Master they hold a little Cabbin, and generally an Acre of Ground. To this poor Laborer, it is of the utmost Consequence, for the Bread of himself and his Family, that his Garden should be sown early; but that it is generally so incompatible with the Business of the Master, that the poor Man's Garden remains unsown with Oats (for Oats and Potatoes are the general Crop) until the latter End of *April* or the beginning of *May*;
 nay,

Experiments on Lucerne.

may, I have seen them sowing Oats in the middle of May. Hence these poor Creatures are too often disappointed in their little Crop; consequently their expected Stock of Provision for the ensuing Year is diminished; and if the master has Inhumanity enough to be deaf to their calls for Food, they must suffer that Hunger, which produces that Countenance of Sorrow and Misery, which I have too often seen in the Laborers of particular Persons, and in particular Districts, instead of that Countenance of Health, which is natural to a Country Laborer, when he is fed.

As much as may be, to remove this too general Suffering of this Kind of Poor: I earnestly recommend to Gentlemen and Farmers, who employ Men in this Way, that they furnish them with the *Rotterdam*, *Polish*, or *Freizland* Oats, to sow their Gardens; because this Kind of Corn, will admit of being sown much later than the common Oats, and although sown late, they ripen in good Time: But if not cut when they are ripe, they are apt to shed; but as the Quantity of Ground which these poor People hold, is but small, the Humanity of the Master should induce him to furnish them a little Assistance, when their Corn is ripe. By such Assistance, the Advantage will be mutual to him and his Servants; they will be benefited, and he will have the Consolation of, at least, being entitled to their Gratitude.

Experiments on Lucerne.

In my Report for the Year 1766, I was so full upon the Culture of this Plant, that I have no Occasion to enter upon those Particulars here; and therefore I shall only now relate how much my *Field Plantation* of transplanted Lucerne produced in the Year 1767, and which was the second Season since putting down the Plants, and close, for the present, with the two important Objects, of feeding dairy Cows with Lucerne, and making it into Hay.

For

For the Quantity produced from this Field Plantation, in the Summer of 1766, which immediately followed the putting down my Plants, I refer to my Report for that Year, Page 49.

The same Row, being 649 Feet long, which had been cut and weighed in the preceding Year, produced in the Year 1767, as follows,

			C.	Q.	lb.
May the 12th,	—	—	1	3	7
July the 6th,	—	—	2	2	7
August the 21st,	—		1	3	24
October the 1st,	—	—	1	2	27
			<hr/>		
			8	0	9
			<hr/>		

The above Quantity being produced from one Row, 649 Feet long, and three Feet being the Distance between each Row, a Plantation Acre will contain thirty-six and a Quarter of those Rows, and therefore our Produce is in the Proportion of 14 Tons, 12 Hundred, 3 Quarters and eighteen Pounds, to the Acre; and that, in the *second Summer* only, after putting down the Plants.

I receive more Pleasure from this Produce, than I shall describe, because it far exceeds the Produce of our small Experiments in the second Year, (as will appear by referring to my Report for the Year 1765, Page 22, and Report 1766, Page 46, where the Produce of each Year is stated,) and is a very inviting Proof of the Value of this Plant, because we have a greater Produce in the Field, in the second Season, by the ruder Culture of the Horse and Plough, than we had in our small Experiments, managed with the Spade.

Indeed, our Field Plantation has the Benefit of a better Exposure, as I formerly mentioned, than the small Experiments had. Our former Experiments proved

proved that to be an Advantage, and this Field Experiment confirms it.

We perceive, that our second Cutting in a Season, affords the greatest Quantity, because the Weather is then warmer, and the Days longer, than at any other of the Times of Cutting during the Summer; and in Proportion as the Days shorten, so our Crops diminish: This seems to shew, that this Plant would throw off prodigious Crops in our *West-India* Islands, where the Inhabitants are much distressed, as I am informed, for Pasture to feed their Cattle; and I am willing to believe, that *there* Lucerne might be raised to great Advantage in the broad Cast Way, because natural Grass, as I am told, grows very slowly in those Islands, on Account of the great Heat; and therefore the Lucerne would not be annoyed thereby, as it is in these colder Climates.

Experiments on the feeding Dairy Cows with Lucerne.

In my Report for the Year 1766, Page 53, I made some Calculations upon the feeding Dairy Cows with Lucerne; but as these Calculations were presumptive, I considered it as incumbent upon me, to try the Experiment as early as I should have it in my Power.

The Field Plantation of transplanted Lucerne, just now mentioned, furnished me that Opportunity, and accordingly I put it in Practice last Summer, to have it with *certainly* in my Power to inform the Society and the Publick of the Consequences, as well as to ground my Calculations of what may be expected from Lucerne, upon Matters of Fact.

In the Report already mentioned, Page 53, I did suppose a Cow would not eat more Lucerne in 24 Hours, than 56 Pounds, because, by a former Experiment, see my Report for 1764, Page 94, I found that a
very

very large Horse eat in one Night 49 Pounds, and as I concluded a Cow would not eat more than an Horse, I therefore allotted 56 Pounds to a Cow in my former Calculation.

To ascertain the Fact, I last Summer bailed up two of the largest Cows I have, and began to feed them with Lucerne, depriving them totally of every other Kind of Food.

I began, by giving each Cow seven Pounds at a Time, and so repeated it every first and second Hour, directing the Man who had this Business in Charge, not to give more than fifty-six Pounds to each Cow in the Day. Thus we went on for two Days, and the Cows devoured their Allowance, without the least Waste.

At the Expiration of that Time, I apprehended the Allowance insufficient, and then ordered the Man to give each of them fourteen Pounds more in the Day. We proceeded thus for two Days longer, and yet the Cows appeared to want more.

I then ordered a second Addition of fourteen Pounds more to each Cow, and even this Allowance they eat up clean.

The Man, who was really very careful and attentive to this Business, said he thought they would yet eat more, although each Cow was now allowed three Quarters of an Hundred, every twenty-four Hours.

Accordingly, I ordered him to give them as much as they would eat, still weighing of it; but instead of seven Pounds at a Time, I directed him to lay it before them fourteen Pounds at a Time, until he had given them Half an Hundred, and then to proceed with only seven Pounds at a Time, until the last Time of foddering them in the Evening, and then to give them fourteen Pounds at ten o'Clock at Night. We proceeded thus for three Days, and each Cow consumed

med every Day 105 suttle Pounds; a Quantity which I own surpris'd me.

However, in the Pursuit of this, we found some Waste, and consequently I reduced the Quantity afterwards, and gave three Quarters of an Hundred weight to each Cow, every Day, for three Weeks, which I found to be a sufficient Quantity.

The Cows fretted pretty much at not being let out with the other Cattle, which made them look a little thin, for the first Week or ten Days; but they gave a great Quantity of Milk, which was exceeding good.

But I did not find that additional Excellence in the Flavor, which some Writers have spoken of; and I shall be allowed to be a Judge of the Flavor of Milk, as other Men are of Wine, because I have, in Purchase of Health, made Milk my principal Liquor for some Years past.

At the same Time that it does not give any additional good Quality in Point of Flavor, yet I consider it an Excellence, that this Food does not give the Milk any Flavor, that it can be distinguished from that of Cows fed upon common Grass, not mixed with offensive Plants, of which there are many.

The Day on which I put up these two Cows to feed upon Lucerne only, I turned two other Cows into a small Meadow, as I did not consider their remaining upon the common Pasture fair, for my future Intention of making Butter from their Milk, to compare with that of the Cows to be fed with the Lucerne, and therefore I devoted a choice little Meadow to this Experiment.

The Milk which was taken from these four Cows, for the first four Days was mixed, indiscriminately, with that of the other Cows, because I apprehended the Food which the Cows now to be fed with Lucerne, had eaten before, might otherwise be incorporated

rated with their Milk for that Time, and thereby disappoint my Enquiry.

But after that Time, the Milk of the Cows fed with the Lucerne, was kept by itself, as was that of the Cows feeding upon the Meadow. After a proper Quantity was obtained, Butter was made of each Kind distinctly.

That I might not suffer my Palate to be influenced by my favorable Opinion of Lucerne, I desired a Pat of each Kind of Butter with a private Mark, to be brought to Table at Breakfast; and they were so nearly the same in Point of Flavor, that I could by no Means distinguish any Difference, both Kinds being as good, I think, as ever I tasted.

During the last Week of this Experiment, I sent some of the Lucerne Butter to some Gentlemen in *Dublin*, who admitted it to be as good as they had eaten of.

Thus I have divested Lucerne of all those additional Excellencies, which disingenuous Writers, and garrateer Farmers attribute to it as miraculous; and rest the Merit of this Plant, principally, upon the great Quantity of Food which it will afford by a proper Culture, of which I endeavoured to give pretty full and clear Directions in my Report for the Year 1766, Page 55.

This being the first Time in my Life, that I ever attempted to feed horned Cattle with Lucerne, it may be observed by the small Quantity I gave at a Time, when I began the Experiment, that I did it cautiously in Point of Quantity, because Mr. Tull has said, that Lucerne will swell horned Cattle: A Disease so dangerous to this Species of Animal, that it behoves every Man to be very cautious how he admits his Cattle to feed upon any Plant which will have that Effect upon them.

This

This Consideration led me to be very circumspect, as this is a Malady by which I have already suffered, * and therefore with an Hope of avoiding this Injury to my Cows ; the Day before I began the Experiment, I had such a Quantity of Lucerne cut, and left in the Field, as I apprehended would supply the Cows for the next Day, and thus I went on for about ten Days, cutting on the preceding, what was imagined would serve them in the succeeding Day, and no apparent Swelling appeared in the Cows.

Thus far my Experiment succeeded to my Wish: But, however, I considered the publick Information, as to this Point, not yet compleat, and therefore, for theirs, and my own Satisfaction, I was induced to extend the Experiment yet farther.

And consequently, I ordered the Quantity which one of the Cows was to consume after twelve o'Clock in the Day, to be cut as it was to be given her, until the Approach of Evening, and that what she was to eat then, should be cut before the Dew fell upon it. This Method was pursued for two Days, and the Cow appeared very well.

Hence I was led to Hope, that no Injury would arise to the Cow, let me cut the Lucerne when I might.

Accordingly, I ordered her Allowance to be cut immediately before the Hours of laying it before her, and she eat it very freely ; but towards the Afternoon, we imagined she began to swell a little, and towards the Evening she was considerably swelled. Upon this I ordered her to be turned out, and attended myself to see her drove about, and in about half an Hour she discharged her Excrement, like that of Cattle turned into Grass in the Spring ; by this, the Swelling abated, without any other Operation, and the Cow was

* See my Report for the Year 1764.

returned

returned to the House, and received her Allowance of Lucerne, which had been cut the Day before.

I proceeded with this Cow the same Way the next Day, and she swelled again, and the same Method removed it. A third Day I repeated it, the like Effects appeared, and the same Remedy had the like Success.

Not yet quite satisfied, apprehending perhaps, that this Effect of the fresh cut Lucerne, might be constitutional in this Cow, which is a young one in Comparison of her Companion, I was induced to try the same Experiment upon her, repeated in the same Manner, in giving her the Lucerne; and she swelled also, but not near so much as the other, and as I did not value her (the older one) so much as I did the former Cow, I was determined yet to extend the Experiment further, well knowing, that in Case of Necessity, I had the Remedy in my Hand by the Knife *, and therefore I did not turn her out at all, but kept her bailed up, still plying her with her Allowance regularly, which she continued to eat; and at length the Swelling abated in the Intervals of giving her the Lucerne, and rose again, when she had eaten her Allowance, and thus I went on for several Days; the Cow suffering no apparent Injury, other than that I imagined the daily Swelling, began to make her look a little thin. This was very material, and therefore we had recourse to the former Method of cutting the Lucerne the Day before she was to eat it.

The Swelling which attended this Cow, not being accompanied with Danger, added to the Circumstance of the other Cow, which underwent the same Experiment, and was relieved by being drove about a little, induces me to believe, that where Cattle shall be al-

* See my Report for the Year 1764, where the Manner of Stabbing Cattle which are swelled by eating Clover, &c. is described. And I am to add, that since that Publication, I have practised that Method with Success, where Cattle have been swelled from other Causes.

lowed to pasture upon Lucerne in the Field, no Danger will arise to them, provided, upon their being first turned in, that they shall be full of Common Grass, and that, for the three or four first Days, they shall be allowed to Pasture upon the Lucerne, only for a few Hours in the Middle of the Day, *that being Dry*, and continue this Practice, until they begin to purge; in that Case, I do believe, no Inconvenience will arise to the Beast. The Advantage to the Farmer or Dairy Man I shall shew presently.

The Reader, who shall not be acquainted with the Nature of this Disease of Horned Cattle Swelling, by eating this Grass, may, perhaps be deterred from the Use of it, if he has read what I have said in my Report for the Year 1764, respecting Cattle being swelled by the eating Clover. But to abate any Apprehensions of Danger, which he may conceive, I am to inform him, that I have had my Cattle as much swelled, by the eating Meadow Grass, when cut and brought to them in their Bails, as these Cows were by the Lucerne, in the second Stage of my Experiments, if I may be allowed so to distinguish it. This Practice of keeping Horned Cattle bailed up at Night, and Feeding them with mown Grass, promises many profitable Advantages to every Occupier of Land, but more particularly to those who wish to improve with Expedition, and to make their Pasture hold out longer, than it can do in the common Method of pasturing Dairy Cows and running Stock; but I do not mean to enlarge upon this Subject here, as my Experience of it, has not yet furnished me with that accurate Information, which I wish to communicate to the Publick, upon so material a Point, and therefore I shall postpone the saying more on that Head, to some future Opportunity.

The Experiments already related, so clearly shew the Effects of Lucerne upon Horned Cattle, that it is quite unnecessary for me to make any Observations upon the Practice, as the Effects shew the certain safe Method of giving this Grass to them; and therefore, I shall

shall now proceed to shew the Profits which may arise to the Cultivator of Lucerne.

Calculations upon the Produce of Lucerne, and how many Cattle it will maintain, founded upon the foregoing Experiments.

In my Report for the Year 1766, I made some Calculations, to ascertain how many Cattle it is probable an Acre of Lucerne, producing thirty-four Tons would maintain.

In those Calculations, I *presumed* a Cow would not eat above fifty-six Pounds in twenty-four Hours, the preceding Experiments shew, that I was much mistaken in that Supposition, since Practice hath shewn, that a Cow will eat much more, and therefore our former Calculations must be incorrect, though the Reader will please to remember, that I made great Allowances in the Close of that Calculation. See Report for the Year 1766, Page 54.

Our former Experiments have also shewn, that Lucerne cultivated in Drills, will, in the third Year, produce above thirty Tons of Pasture from an Acre. See Report 1766, Page 44. And that transplanted Lucerne will produce above thirty-four Tons. See the same Report, Page 45.

Upon the Produce of the transplanted Lucerne, I shall therefore make my Calculations, because our Experiments have incontestibly proved that to be the best Culture, and for the Practice, see my Report for 1766, Page 55.

Thirty-four Tons, twelve Hundred, two Quarters, being the Produce which may certainly be expected from an Acre, in and after the third Year, the Rules and Methods recommended in the above-named Report, being observed and executed in the Cultivation ;

D 2

upon

Calculations upon the Produce of Lucerne, &c.
upon that Produce, and the Quantity which our preceding Experiments have already shewn, a Cow will consume, we shall now ground our Calculations.

The repeated Experiments which I have now made in this Climate for four Years past, have shewn, that Lucerne will be fit to cut in the Beginning of *May*, and that it will afford successive Crops, until the Beginning of *October*; and consequently, that our Cattle may therefore be fed upon Lucerne in the House, for five Months; but if they shall be allowed to pasture upon the Lucerne they may begin about the Middle of *March*, and finish in the latter End of *October*, which will be seven Months; but a Knowledge of the Profits from the latter Method, must arise from an Experience, which nothing can shew, but a more general and more extensive Culture of this Plant, than has hitherto been in Practice; and therefore I shall confine my Calculations to the Method which I practised in the past Year.

To proceed then, our Quantity of thirty-four Tons, twelve Hundred and two Quarters, being reduced to Pounds, it will appear that a Plantation Acre of Land, even such as mine *, will produce 73080 Suttle Pounds, which being divided by 84, that being the Quantity which our Experiments have shewn a Cow will eat in twenty-four Hours, our Answer will be 870, which are the Number of Days, which the Produce of an Acre would maintain one Cow.

As our Lucerne is in Profit for cutting, only about five Months, we shall now examine how many Cows an Acre will maintain for that Time.

The Experiments already related, having shewn 84 Suttle Pounds to be the proper Quantity for a Cow in twenty-four Hours; that being multiplied by 6, the Answer will be 504, which are the Number of Pounds that six Cows will eat in twenty-four Hours,

* For its Quality, see Report 1764, P. 39.

that

that being the Divisor of 73080 Pounds, which is the Quantity our Experiments have shewn an Acre to produce, the Answer will be 145, which are the Number of Days that one Acre of Lucerne will maintain six Cows, that is five Calendar Months of the Summer, wanting seven Days.

To pursue the Mode of Calculation, upon the certainty we now go, which I pursued last Year presumptively, I shall suppose twelve Calves to be put upon those six Cows; and that at a Year old, they shall sell for fifty Shillings a Piece, that would amount to thirty Pound. May we not reasonably value the Summer Keeping of them at half the Price they will fetch?

In that Case, our Acre of Lucerne will afford a Profit of fifteen Pounds a Year, out of which we are to deduct the Sum of two Pound nine Shillings and six Pence, which is the annual Expence upon an Acre of transplanted Lucerne *, which will leave a neat Profit of twelve Pound ten Shillings and six Pence.

Although I have valued the Calves at only fifty Shillings a Piece, yet, if they are of a good Kind, they will sell for three, four and five Pounds an Head, in Proportion to their Size and Shapes, which depends entirely upon the Conduct and Spirit of the Breeder, in the first Purchase of his breeding Cows and Bull, the latter of which I earnestly recommend both Attention and Spirit in the Purchase of, for I have experienced, that a midling Cow will bring an handsome Calf from a good Bull, and that a good Cow will bring but a poor Calf from a bad Bull.

Besides the Profit arising, as already stated, in the two last Months, the Cows may spare a good deal of Milk from the Calves, as the latter will then feed upon Grass; and over and above these Profits, a great

* For the Particulars, see my Report for the Year 1766, Page 52.

Lucerne made into Hay.

Quantity of Dung will be made, to enrich the Land of the Farmer or Breeder.

And to conclude, let every Man consider how advantageous this Grass must be to every Occupier of Land, when it is well known, that one Acre of good common Grass will do no more than maintain one Cow for the Summer; from this Method, it appears that the same Quantity of Ground will maintain six, for the moderate annual Expence of two Pounds nine Shillings and six Pence.

An Experiment on the making Lucerne into Hay.

The *French* have such a Scarcity of what we call Common Grass, that they make Lucerne into Hay, and the Writers upon Agriculture in *France*, enlarge greatly in the Recommendation of it, as a Winter Fodder, both for Horses and Horned Cattle.

The Culture of it in these Kingdoms, has been so little practised, that I have never yet known any Gentleman or Farmer who has made it into Hay.

Our Experiments have shewn that a great Quantity of Fodder may be obtained from an Acre of Land, provided the proper Care be taken in the Culture.

But even with that, I have never been able to bring my Lucerne, to produce any Thing like the Quantities which the Writers already mentioned, give us an Account of; perhaps as mine becomes older, more may be obtained than I have hitherto had.

Some Persons, who may be invited into the Culture of Lucerne, may, perhaps, rather be inclined to make Hay of it, than to convert it to the Uses which I have already calculated upon; and therefore I have, for the Information of such, made an Experiment upon

upon the making it into Hay, by which the Waste is ascertained; and thereby we can pretty accurately calculate how much Hay may be expected from an Acre of Lucerne in a Season, provided the Whole shall be made into Hay; which I would not recommend, for Reasons which will appear presently.

Last Summer I cut one Hundred, one Quarter and thirteen Pounds of green Lucerne, which I laid carefully upon a Grass Walk, and had it made thoroughly into Hay; after which it was weighed, and then there was no more than one Quarter, sixteen Pounds and an half; by which it appears, that the Waste in Drying was something more than *three-fourths*; this I consider as a great Deal; but what Proportion it bears to the Waste upon Common Grass, when made into Hay, I cannot tell; however, I shall inform myself of that Particular, in the ensuing Summer.

We have already seen, that the Produce of Lucerne from an Acre, will be 73080 Suttle Pounds. If we divide that by the Quantity, viz one Hundred, one Quarter and thirteen Pounds, or 181 Pounds of green Lucerne, which I made into Hay, our Answer will be 404, wanting only 34 Pounds in the Acre. This Number, *i. e.* 404, being multiplied by the Quantity of Hay produced, *i. e.* 1 Quarter, 16 Pounds and an half, or 44 Pounds and an half; our Answer will be 17978 Suttle Pounds, or 8 Tons and 58 Pounds of Hay from an Acre, which is above 40 of our Loads.*

Every Man is so well acquainted with the Value of Hay, and the Price varies so much, from many Causes, that I shall not put any Value upon this; it being a sufficient Satisfaction, that we see an Acre of transplanted Lucerne at, and after, three Years old, will produce above forty Loads of Hay, which I believe is four Times the Quantity, produced by the Bulk of the Meadows in the Kingdom, and I believe twice as

* Four Hundred weight is a Parliamentary Load of Hay in Ireland.

Lucerne made into Hay.

much as the highly manured Meadows near the Metropolis, or the rich Lands of Munster.

On the other Side, I just now said, that I would not recommend the whole Produce of Lucerne in a Season to be made into Hay. My Reasons are, that the latter Crops cannot be so conveniently made into Hay as the two first, because we have not always sufficient Sun to do the Business, but in the Months of *May*, *June*, and *July* we have, and therefore I recommend (where Hay shall be the Object) the Crops of those Months to this Purpose, and the latter Crops to the Purpose of Feeding Horses or Horned Cattle in the House.

We have seen that our Quantity of Hay will be above forty Loads to an Acre; but whether the Quantity shall be more or less, depends upon the State which the Lucerne shall be in, at the Time of Cutting, for if it be suffered to stand until the Lucerne be in full bloom, in that Case, the Waste in Drying will be less, and consequently, the Quantity of Hay more, but if cut just as it begins to blossom, or before, so in Proportion the Waste will be more, and the Hay less.

For Coach Horses, and other useful working Cattle, the first Method will be best, but for the pretty delicate Creatures which are intended for the Turf, the Lucerne should be cut when full of Sap, for the Purpose of making Hay, by which it will retain its fine Green Colour, and will be very fine Hay.

A SHORT

A SHORT
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M DCC LXIX.

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INTRODUCTION.

To the R E A D E R.

WHEN I began this Factory, I had no Conception that the Demand would, in many Years, be equal to the Calls which have been, in the short Time since its Establishment, and therefore the Plan was originally calculated upon a small Scale. The unexpected Demand, I am sorry to observe, proves the Want of good Instruments for all the Branches of Agriculture in this Kingdom. Sensible of this Inconvenience, the Gentlemen who generously, in Behalf of their Country, bend their Attention to that *Support* of every other Science and Manufacture, have heretofore been importing Instruments from such Parts of the World, as they have imagined could best supply them. But from a real Want of an Establishment of this Kind, for the making all Kinds of Instruments for Husbandry, the Importation of useful Ones has not answered the laudable Purposes of the Importers; at least the Instruments have not been so generally introduced, as every Man of generous Sentiments must believe to have been the Intention of the Importers; for when they have been landed, they have been immediately carried to the Neighbourhood of the Importer, and at best, brought into Use only in that particular District; so that if a good Instrument should, by this Means, be introduced in the *North*, the *South* could receive no Benefit from it, and so *vice versa*; from which Cause the general Introduction of good Instruments must have been slow. But when we add the Consideration of an Unwillingness in Mechanicks to make from the Patterns

INTRODUCTION.

Patterns so imported, and what is quite as inconvenient, a Want of Men to shew the Use of them, it is not to be wondered at, that Tillage is in no better State in *Ireland*, than it is in many Parts of *England*, where it is, from the same Causes, in as bad a State, I believe, as in any Part of the World ; at least, any Part which pretends to the Practice of Agriculture. From the latter Cause it has too often happened, that Instruments of real Use have been thrown aside, neglected, and abused, until they became unfit for the Use of the most experienced Hand.

It was conceived, that if a Factory were established, for making Implements of Husbandry, it would be a Means of dispersing throughout the Kingdom, Variety of Instruments of the best in their Kinds ; but that alone would not have done, if the Maker had not a competent Judgment in the Use of them, and a Notion of constructing such new ones as have been wanting, and improving such as have been defective. How far I have answered that Expectation of my Patrons, I shall submit to the candid Consideration and Experience of the Public.

Many Persons have, heretofore, made and executed a single Machine of particular Construction, and that with Success to themselves and the Publick. But I believe, I am the only Person, who has ever attempted, to execute Machines, for every Branch of Agriculture, or that can be useful in the Business and Pleasure of a Country Life.

How far this Attempt has been attended with Success, I shall not presume to describe ; but appeal to the Approbation of the Publick, in their Use of the Machines, and the Demand I have had ; for in about two Years, I have sold to the Amount of one thousand six hundred Pounds worth of them.

How far the Publick must be benefited, by such a Variety of Models, in their full Proportion, being dispersed over the Kingdom, from which others are daily making,

making, without the Trouble of calculating their Scantling and Iron Work from Scales (for which the common Run of Workmen are by no Means qualified) I submit, to the Consideration of the Candid.

Reflecting, upon what must be the Sentiments of such; I feel some Consolation, amidst the Care, Application, Anxiety, constant Exercise of Mind, great Expence, and the severe Consequences of the Misfortune I sustained, in the Prosecution of this Undertaking; hitherto, without any Benefit, to myself or Family.

For I can truly say, that I have ever been much more ambitious, of acquitting myself, to the Satisfaction of the Publick, thereby to reflect Honor to my Patrons, than I have thought of Emolument to myself.

An Enthusiasm, perhaps, not sufficiently tempered with Prudence.

However, at that I shall not repine, but whatever may be my Fate, I shall endeavour to Heal the Consequences, with the comfortable Consideration, that I have acted diligently and faithfully, in the Trust committed to my Care.

And I hope I shall be pardoned for believing, that my Façtory has already prevented the Importation of many Machines for Agriculture, and put *Ireland* in Possession of several useful Ones, which are to be found in no other Country.

Had this Façtory been established in any remote Part, its Effects could not have been diffused through the Kingdom, as I believe, the Demand will shew them to be. Had it been established immediately in the Metropolis, it would likewise have been less effectual, I am willing to believe, than it has been in its present Situation; for this plain Reason, that the
mere

mere looking at the best Machines for the Manufacture of Land, could not be sufficiently persuasive of their Importance and Use, unless the Management of them in the Field, or, at least, the Effects of their Operations could be seen. The Situation, being not beyond a Morning's Ride from *Dublin*, gives all People, from every Part of the Kingdom, who are occasionally brought to the Metropolis by other Calls, an Opportunity of examining, not only into the Nature and Quality of the Machines, but the different Methods of Husbandry carried on with them. The Reports of such as have been here, have induced others, not only to come when they happen to be in *Dublin*, but what must be conceived as more grateful to me, to undertake Journeys of more than an hundred Miles, on Purpose to spend some Days with me. It will hardly be necessary for me to say, it could not be from any personal Acquaintance, because it is well known I am a Stranger here; but from a Zeal in the Cause of Agriculture, which, I have the Pleasure to observe, is peculiar to the Gentlemen of *Ireland*.

I must be allowed to say, that I have frequently, since the Commencement of this Undertaking, felt great Concern that it has not been in my Power to give so general a View of the different Machines I make, as I wish to do, to those who come on Purpose to see them: but it will be considered, that as fast as they have been finished, they have been sent away, because the Demand has always exceeded the Possibility of Execution; besides which, I really have not Buildings to keep an Assortment in; a Point which I am exceedingly anxious to obtain, for the speedier Dispatch of the Orders, and the greater Convenience of the Public.

And I hope it will not be looked upon as extraordinary, that I am not equal to the erecting such Buildings as are necessary to the conducting so great a Work as this is now grown, when it shall be considered, that it is very little more than two Years, since the Building which I had erected for a Part of this Under-

Undertaking, my Dwelling-House, Materials, and Part of my Furniture were consumed by Fire. And indeed, were it ever so compatible with my Circumstances, I know not whether it would be altogether so prudent, to lay out a large Sum of Money, for carrying on a Work, in which the Public are much more interested than I can possibly be as an Individual; for I believe it is a well-known Fact, that many Machines which are purchased of me, are intended only as Patterns for others to work by; a Circumstance, which calls for Circumspection and Caution on my Part, in the Opinion of many. These Considerations, added to the unhappy Event of the Fire, *which came upon me by this Undertaking*, had almost persuaded me to decline this Factory; but when I re-considered who were my Patrons, and the Country I was serving, I could not harbour a Doubt, but my Labours and Misfortune would, at the proper Time, obtain the friendly Interposition of *those*, who will consider them candidly and generously. Still animated with these Hopes, I have persevered in the Re-establishment of this Undertaking, at an Expence, and under Difficulties, which Timidity and Diffidence would tremble at.

But although my Instruments and Methods of Husbandry are passing into many Parts of the Kingdom, with a Rapidity, which the greatest Vanity on my Part could not have expected; yet, should I live, to be by any Means enabled to carry my Undertakings for the general Improvement of Agriculture in *Ireland*, to that Extent, which, what I have done, assures me is infinitely wanting, I do flatter myself, that a very few Years might be productive of this Kingdom's obtaining the first Character in the Article of Tillage, which will necessarily pave the Way to Perfection in every other useful Art, as the Neglect of it, must, on the contrary, be attended with the most fatal Consequences both to the Affluence and Honor of the Nation. But I shall defer saying more upon the extending my Plan till another Opportunity.

In

In the Prosecution of this Undertaking, I have been frequently called upon for Leather Harness, and have endeavoured to get it done in the best Manner that the Workmen in that Way could do it, but as I never could get any done to my Mind, or a Workman who knew how to do it, in the best *English* Manner, although I frequently advertised for one, I have often, where I could do it, declined receiving Orders for Leather Harness. But notwithstanding that, the Demand has still increased upon me, insomuch, that I have been obliged to renew my Endeavours to obtain a perfect Workman in that Branch, and have lately got an *Englishman*, who I find upon three Months Trial, is a compleat Workman, in the making all Kinds of *English* Harness for Ploughs, Waggons, Carts, Coaches, &c. and therefore, I have, after examining minutely into the Expence of every Article, added all Kinds of Leather Harness, both elegant and plain to my List of Instruments, which will appear in their proper Place, to be ranged in such a Manner, as I hope will be intelligible to all Persons who may have Occasion for any Thing in that Branch.

I shall now endeavour to give a short Account of the Uses of some of the Instruments named in the following List, every one of which I have numbered, for the more convenient Reference of the Reader.

A short

A short Account of the Uses of the Instruments, referring, by the Numbers, to their Names, and the Description of their Parts in the List of them hereafter given.

MY former Publications have shewn, that the Instruments for the Drill Husbandry are calculated only for that particular Species of Culture ; and therefore I shall take no other Notice of their Uses in this Place, than just to say, that for the Information of those who may adopt that particular Husbandry, I have ranged the necessary Instruments together, that they may appear at one View, under the Heads, N^o. 1, 2, 3, 4, 5, 6, and 7, in the List.

N^o. 7. Contains an Account of the necessary Harness for the using these Instruments, the Bulk of which it is to be presumed, most People have ; those who have them not, will please to order them with the Machines, otherwise they will not be sent.

N^o. 8. Is a Drill Plough, to which I have given a Place in my List, because I have met with some Persons who have conceived an high Opinion of that Species of Husbandry, for which that Plough is calculated. My Sentiments upon *that Practice* of the Drill Culture will be found in my Report for the Year 1766, Page 38.

N^o. 9. Is a Plough which has been found to answer all the Purposes of the breaking and manufacturing Fallow of any Kind ; the Draft has been found easy to the Cattle, and the Plough, from the Manner in which it is fortified with Iron in every Part subject to Distress, is rendered irresistible, save, that the Coulter, Sock, and Ground-Plates, from the constant Friction in the Soil, must wear, and therefore will sometimes want repairing. What recommends this Plough very much to the Practice of the common
E Plough-

The Description of the Uses of the

Ploughman is, that it approaches the Plough he has been used to, more than any other I make, except the Chip-Plough, N^o. 10, which I cannot recommend the Use of to any Man, because the Chip is never large enough to take a Share with a large Socket, by which Means all Chip-Ploughs are apt to break off behind the Sock or Share ; whereas, my Socks are made large in the Socket, and are always put upon the Point of the Cross.

The Plough, N^o. 11. is calculated for throwing up the last Sod, in sowing Wheat under the Plough in small Ridges, in order to bring the Furrows narrow in the Bottom ; and which I believe answers the Purpose very well, though I have not used it myself, for Reasons which will appear presently. See No. 15, in the List.

N^o. 12. Is a Plough for the Purpose of skinning Ground for Burning ; and I have the Pleasure to understand, that this Plough has compleatly answered the Purpose to those who have used it. I shall just be allowed to say, that the Burning some Kind of Land is undoubtedly a very good Practice, upon its first Improvement ; but in other Cases it is altogether as bad a Practice as can be introduced. See my Hints upon Husbandry, published by Mr. *Flinn* in *Castle-street*.

N^o. 13. Is a Plough calculated for two Horses, said by some People to be capable of the first breaking, and compleatly manufacturing any Ground for Fallow. I must dissent from that Opinion, because I am sure there is much more Land which two Horses cannot effectually break, than there is which they can. To support this Opinion, of two Cattle being sufficient to break Land in general, shallow plowing is recommended as a general Practice, a Practice so contrary to all Principles, that it is hardly worth answering. But let any Man *carefully* examine the Roots of the Plants which are in the Farmers Department, and he will find, that they pass a great Way into the Soil, if the

the Tiller will, by proper Tillage, allow them to do so; but if he will only just skin the Surface, particularly in a strong Soil, he must not expect the Roots of small annual Plants to penetrate in Search of Food, where he has not introduced his Coulter and Share to a proper Depth; and with the Strength of two Horses he cannot; though I defy any Man to hurt this Plough, as I make it, with four, by fair Work. But if, from a Plan of Oeconomy, the Farmer wishes to introduce this Plough, he certainly may do it to Advantage, after he has deeply broken his Fallow, and well reduced it by the Harrow, provided he does not let it remain too long to consolidate. And if, by this Saving, he can be prevailed upon to add one more ploughing than usual, he will undoubtedly find his Account in the Use of these Ploughs in the manufacturing his Land; but 'till he can be dispossessed of the inconsistent Notion of its being possible to make his Land *too fine*, I fear we shall not introduce the Extra-ploughing. The established Method of not exceeding four Times ploughing Fallow, is founded in Ignorance; every Fallow should be ploughed, until it is well reduced to receive the Seed.

N^o. 14. Is the Lomax-Plough for four Cattle, to draw double, and is such a one as Practice has induced many People to approve, I having sold many of them; but every common Ploughman does not like them so well as they do the one I mentioned before, N^o. 9, neither are they, indeed, so fit for *stony* Land, as that, but in every other Respect, answer all the Purposes of compleatly working Fallow.

N^o. 15. Is the Plough which I have called, in my Report for the Year 1766, p. 40, the *Seeding* Plough; in the Use of which the Farmer will find many Advantages: But I shall say no more in the Recommendation of it, than to refer him to the Report already mentioned, and leave his Experience to examine the Merit of the Instrument, in the sowing Corn under the Plough. I before said, when I was speaking of the Hunting-Plough, N^o. 11, that for Reasons which

The Description of the Uses of the

would appear presently, I never had used that Plough ; which are, that I find this Plough answers all the Purposes of *that* and the four Horse Ploughs, which are used for the *sowing* or rather *burying* Wheat. Some indeed, who pay Attention to their Tillage, have very properly had two of these feeding Ploughs, which, with one four Horse Plough, I call a Set of Ploughs for the common Husbandry. The two small Ones are the one wider and the other narrower in the Sole : The latter of which always follows the wider one, and clears up the Huntings, by which the Work goes on mathematically ; whereas, it would be inconsistent, in finishing the Ridges, to have the wider Plough following the narrower. A Point not sufficiently attended to in the general Construction and Use of Ploughs.

Nº. 16. Is a Plough of the same Kind, to be worked with only one Horse, either in the Field or Garden, which I think may very advantageously be introduced in the Field for sowing Corn under the Plough in broad Ridges, provided the Land be first *well manufactured*.

Nº. 17. Is a large strong Plough, calculated, at the particular Request of some Gentlemen, for the ploughing very deep, by a great Strength of Cattle, and those who have had them, have been kind enough to inform me they answer compleatly. Unhappily for me, I cannot use them in my Soil, the Quarry being too near the Surface.

Nº. 18. Is a Plough which is calculated for keeping Land flat in its Tillage ; I presume first introduced on very dry Land, the better to retain Moisture, in which, I have no Doubt, but that it may answer ; and it has also been introduced for the Purpose of laying Land flat, which is intended for Lawns and Meadows. I shall not enter into the Merits of this Instrument, further than to say, that I have endeavoured to divest it of the Wheels, by which to render it a
cheaper

cheaper and less complicated Machine, than it can be when worked with a Carriage.

N^o. 19. Is a Plough, which Mr. *Tull* sensibly calculated for the speedier Reducement of Ground ; but the Draft of it is no less heavy than its Expence ; and at the Time he invented this Plough, the Scarificator, N^o. 27, had not been thought of. But as we are now in Possession of that Machine, which will so effectually cut the Ground into Slips or Strings of three Inches broad, that by preceding the four Horse Ploughs, N^o. 9 or N^o. 14, a little while before the Ploughs begin to turn the Land, all the Purposes of Mr. *Tull*'s four-coultered Plough will be answered.

N^o. 20, and 21. Are Wheel-Ploughs, which, from my Observations upon their Operations, I conceive cannot be so effectual in general Use, as Ploughs without Wheels, for this plain Reason, that as the Wheels are the Gauge for the Depth of the Plough, wherever they meet with any Thing which raises them, the Plough consequently rises so as to work shallow, and sometimes not to touch the Surface ; at other Times, when the Wheels sink into any Declivity, the Plough immediately sinks in Proportion, so that the *Ploughing* is rendered irregular by those Kind of Accidents, and will continue to be so until the Ploughs have been at Work upon the same Land for some Years. Another Consideration against them is, that they are in general complicated, and not a little expensive.

N^o. 22, 23. 36, 37, and 41, are Sledges and Truckles for various Purposes. I shall only just add, that I wish it were more generally the Practice, to introduce Sledges for removing our Ploughs and Harrows from Field to Field than it is ; for by the too general Manner of removing them, they often receive more Injury than by a Month's Work ; besides which, the Cattle are too often hurt.

N^o. 26. Is an Instrument, calculated for the Purpose of marking out Drains with strait Edges, in order to save the Expence of that Part of the Work being done by a Spade and Line, which is attended with Delay ; and the Machine is so constructed, that the Drain may be marked out from sixteen Inches to two Feet wide, at Discretion. Where large Quantities of this Kind of Work is to be done, the Machine will save considerable Expence ; but where the Quantity of Work is but small, it will be an unnecessary Purchase.

N^o. 27. Is the Scarificator mentioned before, when I was speaking of Mr. Tull's four-coultered Plough, to which it will be a very useful Substitute : and as to its other Purposes, I refer the Reader to what I have said of it, in my Report for the Year 1765, Page 41, &c.

N^o. 28. Is an Instrument which I built upon the two preceding ones, in order to lessen the Expence to those who may have Occasion for them both, and which I have the Pleasure to observe, operates completely in either Case.

N^o. 29. Is calculated for sinking Ditches by the Strength of Horses, after they are laid out, in order to save *Spade Work* ; but after the Ditch shall be sunk, the Sides, it will be imagined, must be dressed by the Spade. This Plough has also been found very useful in sinking Potatoe Furrows, which saves the Labour of the second Spitting, and reduces the Soil at once to the Command of the Shovel. It has also been found useful in deepening the Furrows, for the second covering of the Corn by the Shovel.

N^o. 31 to N^o. 41, both inclusive, are Harrows of different Kinds ; Instruments so universally known, that I need not say more of their Use, than just to observe, that the Harrow, in general Use in this Kingdom, is too often ineffectual in its Operation, by its
being

being made only in *one* Frame; but by mine being made in two Frames, united together by what I call coupling Bolts, they lie close to the Ground,* even in irregular Places, and therefore, I flatter myself, fulfil the Purpose of the Machine, namely, harrowing; whereas, the Harrow which is made with one Frame rides all rising Places in the Field, and consequently passes over hollow Places very frequently.

* The triangular Plough-Harrow, No. 32, is indeed an Exception to this Observation, because it consists of only one Frame; but then this Instrument is made in a particular Manner in the Pins, to *bite* the Ground, (if I may be allowed the Expression) because the Operation of it is diametrically opposite to that of the common Purpose of Harrows; for this Instrument acts like a Miner, under the Surface, the others act above it. And, indeed, the very *Name* which I have given this Instrument seems to indicate, that it is to act somewhat like a Plough, as well as an Harrow. This Instrument is wonderfully powerful in reducing Ground, clearing Weeds, Stubble, &c. and is really easier in its Draft, than would be imagined by looking at it.

No. 42 to 53, both inclusive, are Waggon and Carts of different Kinds. Were I to enter into a general Description of their Construction, it would swell this Paper greatly beyond the Bulk of what I intended; and therefore I shall only beg Leave to inform the Reader, that I have given very particular Attention to the Improvement of this Kind of Carriages; and I have the Pleasure to think, that the Demand I have for them, is as strong an Indication as I can have, that in the Judgment of others, I have not been unsuccessful in that Attempt.

* I have an Harrow for reducing Ground, of quite a new Construction now in Hands, and before my next Publication, shall try it; and if it answers my Expectations I shall give it a Place in my next List.

Some Considerations upon the Construction of the Two Sorts of CARS in general Use, througbout this Kingdom; with a Description of One of a new Construction, N^o. 54 and 55. calculated to carry greater Burthens, and with much more Ease and Safety to that generous Creature, the Horse.

The Low-
ness of the
Wheels of
an Outside
and Inside
Car.

THE Advantage which is apprehended to be gained by the Lowness of the Wheels of common Cars, is said to arise, from the Weight of the Load, pressing them forward. And yet, I have generally observed, that the *greater* Weight of the Load is put on *before* the Wheels, and that *entirely* in loading Stones. Hence it should seem, that if the Weight of the Load, does at all contribute to the Motion of the Wheels, instead of its contributing to their Motion *forward*, it must on the contrary, press them *backwards*. And the *lower* the Horse, the *greater* will be *that Effect*. But to be mathematically full upon this Head, would require more Room, than the intended Bulk of these Considerations will admit of.

The Friction upon the Gudgeons of an Outside Car.

The Gudgeons are in Contact with the Bolsters, which are always *Wood*, and therefore the Friction must be more laborious to Cattle, than when in Contact with Metal or Brass. Besides, the Bolsters are generally about four Inches broad, and therefore bear four Inches upon each Gudgeon, which must still cause a greater Resistance, by an *Increase* of Friction. Whereas a small Spok Wheel, when *properly bung*, will not have a Friction of more than an Inch and an half, and that will be lessened by its being Steel against Metal or Brass.

Inside Cars
their Friction.

The inside Car is yet a more laborious Carriage to Cattle, because the Friction in that is between *Wood* and *Wood*, which is in Contact *eight* and *ten* Inches. The Axis is of Timber made round; and the Sides of the Car are laid upon that. To prevent the Axis wearing

wearing in the Place of Friction, it is often stuck with Nails. I have lately seen a few Instances, where the Axis has been covered, in the Place of Friction, with Cast Mettle, which is an Amendment.

Both the Carriages of this Kind, and which are the common ones of *Ireland*, have their Wheels made of Plank, commonly called *Block Wheels*. Through these Wheels pass the Axis, which is of Wood, and generally about four Inches square. The Wheels have a *square Mortice* made through them to receive the Axis upon which they are *firmly wedged*. Wheels, how made, and how fixed upon the Axis.

The Consequence is, that the Axis must always turn *with* the Wheels: And one Wheel cannot turn *independant of the other*. Hence follows infinite Distress to Cattle. Consequences.

For when the Carriage is to turn short, as soon as the Point on which the Horse presses at his Shoulder, forms an acute Angle with the Wheels, the Wheels *cease to turn*, for they immediately drag. The Horse is obliged to exert *all* the Power he has against this Resistance; which in *this* Operation is *Sideways*, and therefore he is deprived of at least half his Power, in the very moment, in which he wants an Exertion of the greatest he has, to conquer the natural Obstruction of the Machine. But if Straw, stiff Dirt, or a Stone, meet the Wheel which *should go forward*, the Horse actually stops, and cannot move the Carriage, till the accidental Obstruction be removed.

And this Effect arises, in turning *either* of the Carriages named. The Body of the Carriage is frequently racked and broken, and the Horse often falls.

The Block Wheels in deep Roads, collect and carry with them great Quantities of Clay, which very soon come in Contact with the Car Sides and Inside Back, by which the Horse is infinitely distressed, and at last will be obliged to stop, unless an unmerciful and giddy Driver force him on, until he falls by Drawing,

**The Description of the Uses of the
Drawing.** Careful Drivers are much interrupted in their Journeys, by removing these Obstructions, which frequently require a good Deal of Labour.

In drawing Hay Home, the outside Cars are often stopped by a Collection of Hay between the Wheels, Sides, and Gudgeons, which take so much Time to remove, that I have often had Delay, Irregularity and Interruption ensue, in the drawing Home Hay, and which the Farmer must often have experienced.

Another
Cause of
Friction.

The Ends of the Axis to an outside Car, come so nearly in contact with the Sides, that there is a continual Friction between them. In turning the Carriage, the Ends of the Axis immediately lock firm against the Sides. All tending to the Distress of the Horse.

A short Description of the NEW CAR.

The new
Car.

Having thus shewn the Inconveniencies which attend the Construction of the common Cars, I shall now shew how far I have endeavoured to remove them, in the Construction of the Cars, named in the following List, N^o 54 and 55.

Why the
Form of the
common Car
was adhered
to as much
as could be.

I apprehended a Carriage which adhered, as closely as might be, to those in common Use, would be most likely to make its Way into general Use.

Friction,
why less in
this Carriage
than a com-
mon Car.

First, as to the Objection made to the Friction in the common Cars, I have endeavoured to lessen that in this Carriage, by Iron Arms, steeled; running in Metal Boxes, touching in each Wheel, only about an Inch and an Half.

The one being *Steel*, and the other *Metal*; both hard Bodies; it is apprehended the Friction must be considerably less than in a common Car; and consequently the Resistance lessened at equal Weights.

Why Brass
Boxes were
not chosen.

Brass Boxes would have been chosen, were it not, that it is apprehended they would be too dear for the lower People.

The

The Height of the Wheels exceed those of a common Car only about six Inches: But notwithstanding that, the Body of the Carriage is raised, by the Manner of hanging the Wheels, which will appear in the Machine. The Reason for which is, to bring the Shafts as near upon a strait Line as may be, to the Point of Draft in the Horses Shoulder; whereas, in the common Cars, the Points of the Shafts (commonly called the Sides) are so high, caused by the Lowness of the Wheels, that when the Draft is from the Points of the Shafts, the Shafts, and Point of Draft in the Shoulder of the Horse, form an obtuse Angle, by which the Horse is drawing upon his Back, greatly to his own Distress. To remove this Inconvenience, some have a Chain running as far back, under the Shaft from the Collar, as brings the Draft upon a direct Line. But this is liable to two capital Objections, particularly in the common Cars. Because in the Action of turning the Carriage, the Shaft from which the Beast draws, is a Lever to him, and by so much as he loses of its Length, in Proportion he is deprived of the Use of it, as a Lever. And every Man knows that the Ease of a Purchase, depends upon the Length of the Lever. The other Objection is, that when the Carriage inclines to fall backwards, which is too often the Case, the Horse cannot prevent it so effectually by his Draft's being so far back upon the Shafts, as he can when his Draft is from the Points, upon the same Principles, that his Lever is considerably shorter, than when he draws from the Points of the Shafts. But in this Case, the Purchase is perpendicular; whereas in the former it is horizontal.

As to the Inconvenience, which attends the common Car Wheels not turning properly; in this I have totally removed it, by using Spokk Wheels, which are to turn upon the Axis, independent of each other; but the Axis is not to turn, as in a common Car.

The Height of the Wheels. The Body raised. And why.
Wheels turn independent of each other. And why Spokk Wheels are chosen.

Another Reason for choosing Spokk Wheels is, that they are by no Means so liable to collect Clay or Dirt in their Passage, as the Block Wheels to a common

Further Reason why Spokk Wheels are chosen. Car, chosen.

In common
Practice,
Wheels
hung impro-
perly.

And why.

Car, and therefore less liable to the Obstructions caused thereby; unless when they are improperly hung, which I am sorry to observe is too prevailing in this Kingdom, and even in *England*, as may be explained to such Persons as shall wish to understand it; as may also, the Manner of clouting a wooden Arm, or making an Iron one to most Advantage, which as much as possible, is kept a Secret in the wheeling Business; for there are many Men of that Trade who can make a good Wheel, and yet know not how to bush and hang it. Upon which *totally* depends the easy Draft of a Carriage.

Best Manner
of bushing a
Wheel.

To bush a Wheel in the best Manner, and most expeditiously should be done with an Engine, calculated for that Purpose only.

Block
Wheels
cannot be
effectually
bushed.

Block Wheels cannot be bushed properly, as Experience has often proved; for there are Gentlemen of Ingenuity in this Kingdom, who have seen the great Inconvenience attendant on the Operation of the common Car, and have attempted to remove it, by putting Boxes in Block Wheels, in order that they might turn independent of each other, upon Iron Arms; but it has been found, that great Difficulty attended the fixing the Boxes, because, if put really into the Plank, they cannot be wedged, it being impossible to drive the Wedges across the Grain of the Plank. To remove that Difficulty, a Piece of Timber has been lodged in the Centre of the Wheel, placing the Grain of the Block horizontally, and thereby the Boxes could be firmly fixed in that Piece: But the Remedy was almost as bad as the Disease; for the Block, or Piece of Timber, which is so lodged in the Centre of the Wheel, soon became loose by Labour and Contraction, and consequently that Part of the Carriage must fall into a crazy Fabrick; abstracted from Labour being increased to the Horse, as soon as the Wheels, in their revolutions, form that offensive Sight, zigzag Lines, which is the unavoidable Consequence of being out of Square, be the Wheels what Kind they may.

In

In the Article of putting on the Tire, I flatter myself some Amendment is also made, and which I now pursue in all the Carriages made in my Factory.

Manner of putting on Tire improved.

In the common Manner of putting Tire on Wheels, the Nails are apt to start, and the Heads break off, by either of which Accidents the Tire gets loose, and the Wheel is suddenly racked or shaken. To prevent this, I put every Strake on with Screw-bolts, which draws up the Tire, and keeps it to its Place, from which it never can start, till the Tire be worn out.

The Manner of making the Heads of the Bolts, and punching the Tire, I apprehend, would be a great Preservation of our Roads, were it in general Use. And therefore seems to merit the Attention of the Legislature; for by the general Manner of making the Nails for Tire, the Law for the Establishment of broad Wheels is defeated.

Roads how to be preserved by the Manner of making Tire-Nails.

To prevent any Dirt or Grit getting in between the Boxes and Arms of the Carriage, Sand-pans are put upon the Ends of the Stocks, and Cuttoos over them, which will appear upon View, and which are put upon all the Carriages made in my Factory. The Iron Brackets which are mentioned, as being added to this Carriage, N^o. 50, in the following List, are disposed in such Manner, as to fortify the Parts most liable to fail in a Car; the Shafts or Sides are plated with Iron from the Axis to the Tug-pin Holes, and in every Part firmly affixed with Screw-bolts, which renders this Carriage a Machine of almost irresistible Strength and Permanence.

Dirt and Grit, how prevented getting into the Boxes.

I might have been much fuller in my Description of this Car, but the Demand I have had for them is a stronger Proof, than any other I can give, of their superior Convenience, in every Kind of Business, in which a Car can be used; and therefore I shall only add, that one Horse has drawn, at one Load, upwards of 26 Hundred Weight upon one of them on a very rough Road; and I am well persuaded, that the same Horse can draw upwards of 30 Hundred on the same Car-

Car-

The Description of the Uses of the

Carriage without any great Distress ; and what seems to be a pretty strong Fact, is, that since I introduced these Cars, my People will not use the old ones, and therefore, I have been obliged to part with all the common Ones I had.

And it is allowed by competent Judges, that they are compleatly calculated not only for the Use of the Farmer, but for Sumpter Carriages on Circuits, military Baggage, Linen Cloth, Carriers, Millers, Timber, and Luggage of all Kinds ; because severe Trials in the Use of them have shewn, that a Horse travels with Pleasure under a Load from 12 to 20 Hundred Weight upon one of them, when, on the same Journey, an Horse, under a common Car, with 6 and 7 Hundred upon him, has been suffering exceedingly by his distressing Draft, of which we have had many Instances, and very remarkable ones in bad Roads.

It must be confessed, that the Price is higher in the *first* Purchase than a common Car ; but yet, when it is considered that this will last much longer, and that the same Horse which draws 5 Hundred on a common Car, will, with more Ease, draw 12 Hundred on this, Candour must admit it to be a much cheaper Carriage, for all the Purposes of Business and Profit. And all Men will allow, that no *perfect* Machine can be had at the Price of an *imperfect* one.

For the Convenience of such Persons as use Turf in their Houses, I have lately put a Cradle to this Carriage, to be put on and taken off occasionally, (see N^o. 57) by which it is said, by those who are acquainted with Turf, that as much may be drawn at one Load, as at three or four, in the common Manner.

N^o 58 to 87, both inclusive, contain a List of various Articles, which, from their Names, shew their Uses, altho' some of them are new ; those which are improved in their Construction will shew for themselves.

N^o. 88. Is an House and Boxes, calculated for the Preservation of Bees, by which large Quantities of Honey and Wax, it is said, may be taken, without murdering those laborious Insects. I have, in some of my former Papers, professed not to understand the Treatment of Bees; but from an Attention which the DUBLIN SOCIETY have lately given to their Preservation, I was animated into an Application towards the Management of them, and have received great Information in reading Mr. *Moses Rusden's* Treatise upon that Subject, and from whose Book I have built one of these Houses, &c. described, N^o. 88. The Pleasure I have received, in seeing their Industry and Mechanism, which this Manner of keeping them admits of, I have conceived to be a full Recompence for the Expence of building their little Habitation, and the Success which the Method promises, induced me to give it a Place in my List. The Edition which I have of Mr. *Rusden's* further Discovery of Bees was printed in the Year 1679; whether it has gone through many Editions I know not, but I fear it is now out of Print, which being, I think such Gentlemen as are reputed Judges of this Management of Bees, would do the Public a Service to recommend the re-printing this Book.

N^o. 89. Is a neat and convenient Kind of Crib, for the more commodiously foddering black Cattle without Waste of their Fodder, calculated more as a Pattern for Gentlemen and Farmers to build them by, than with any Expectation of selling them, they being too large to be carried to any great Distance, but may very conveniently be removed from Place to Place about a Farm.

N^o. 90. Is a Machine, calculated for the slicing Turneps for black Cattle with Expedition. An Instrument which I was induced to bend my Attention to the Construction of, from observing that the Society of Arts in *London* had offered a Premium for the Construction of such a Machine. In that which I have made for the Purpose, it is conceived by competent Judges, that I have not been unsuccessful, because
the

the Machine is fortified by great Strength, at the same Time that it has powerful Execution. The Simplicity of its Construction will render it intelligible to any Man, immediately upon a View of it. The Reasons why it is prudent to slice Turnips for black Cattle, will be found in my Report for the Year 1764.

I continue to give this Instrument a Place in my List, but from the Method which I have lately pursued, in feeding my Cattle with Turneps in the Winter, I have, in a Manner, rendered this Machine rather unnecessary, of which I shall furnish the Publick with Information in my next Report, for the Year 1768.

Nº 91 and 92, are sufficiently described in their respective Places.

A L I S T of the INSTRUMENTS.

Nº. 1. **T**HE DRILL PLOUGH, upon an improved Construction, with Brass Boxes, and compleatly mounted with Swingle-trees, Straps, Turnip-box, and Standards; and for sowing Wheat, Barley, Bere, Oats, Peas, Beans, Turnips, Sainfoin, Burnet, Buck-wheat, &c. 8 Guineas. See p. 9.

Nº. 2. The DRILL HARROWS, of a new Construction, rivetted and mounted with fifty-four Harrow-pins, hung to a Carriage with Chains, Hooks, Keys and screw-bolted Staples. The Carriage mounted with Iron-arms, affixed with Screw-bolts and screwed Staples, Spoke-wheels bound with Iron, a Pair of Shafts, double-twisted Back-band, Staples and Hook, Tug-pins and Chains. 5 Guineas. See p. 9.

Nº. 3. The HOE PLOUGH, compleatly mounted with double Bands, four Iron Wedges, Coulter, Bolts, Keys and Hook, Rider and Screw-bolt, the Mold-board

board, Land-side and Bottom, plated with Iron, Crofs and Beam united by a thorough Screw-pin, a Steele Coulter and Iron Share. 40 Shillings. See p. 9.

N^o. 4. The SINGLE CULTIVATOR, mounted in the same Manner, only that this Instrument has no Mold-board, but is made with a Chip which is plated with Iron. 1*l*. 14*s*. 1½. See p. 9.

N^o. 5. The DOUBLE CULTIVATOR, mounted in the same Manner, but instead of a Share with one Fin, this has two, made of wrought Iron and Steele. 40 Shillings. See p. 9.

N. B. The Instruments, N^o. 3, 4, and 5, are for Horse-hoeing Drilled Crops, and to work them requires a single Swingle Tree, and Swivel Chain, and therefore I shall enter it here as N^o. 6. Where any Person shall chuse to have one for each of them, they will please to order them.

N^o. 6. The SINGLE SWINGLE-TREE and SWIVEL CHAIN. 5*s*. 5*d*. This Swingle-tree will answer for any other Plough, which is to be drawn by Cattle lengthways, and which is always to be the Manner in Horse-hoeing Drilled Crops.

In my former List I named the Marking Plough, and Double Mold-board Hoe Plough, but I there mentioned them as not being absolutely necessary to the Drill Culture, and in the Continuation of my Practice I am confirmed in that Opinion, and therefore I shall not give them a Place in this List, the above Instruments being all that are necessary for the compleat Execution of the Drill Husbandry, except the Harnesses, and two Muzzles, which I describe altogether, under the Article N^o. 7, for the Convenience of such Persons as have them not, or who cannot conveniently get them.

N^o. 7. The HARNESSES for the Drill Hußbandry, described under one Head, with the Prices of each Article. When Gentlemen order them, they will please to distinguish, whether they would have those under the Column A, B, or C, by naming the Letter, there being a Difference in the Price, and consequently in the Quality.

A.

B.

C.

	No.	l.	s.	d.	No.	l.	s.	d.	No.	l.	s.	d.
Three Bridles, —	107	at 0	11	4½	108	at 0	8	0	109	at 0	6	0
Three Neck Collars, —	115	0	11	4½	116	0	7	6	120	0	4	6
One Cart Saddle and Crupper,	133	0	17	4	134	0	11	4½	135	0	7	6
Two Back-Bands and Pads,	148	0	8	8	—	0	8	8	149	0	6	6
Two Belly-Bands, —	143	0	3	3	—	0	2	2	—	0	2	2
Two Back Cruppers and Hip Straps,	156	0	7	7	—	0	7	7	—	0	0	0
Two Muzzles, —	167	0	4	4	158	0	4	4	159	0	4	4
Two Pair of Trace Pipes, —	157	0	5	5	—	0	3	6	—	0	2	8½
Three Hame Straps, —	165	0	0	4	—	0	0	4	—	0	0	4
Two Pair of Collar Hames, —	99	0	6	6	—	0	6	6	—	0	6	6
One Pair of Draft Hames, —	99	0	8	1½	—	0	8	1½	—	0	8	1½
Two Pair of Long Traces, —	97	0	11	4½	—	0	11	4½	—	0	11	4½
One Stretcher, —	96	0	2	2	—	0	2	2	—	0	2	2

No. 8. The DRILL PLOUGH of a new Construction, for sowing Drilled Crops in the Flat Way at equal distant Rows. 6 Guineas.

N. B. I would not be understood to recommend this Instrument, because I conceive but an indifferent Opinion of the Husbandry. But as others may form another Opinion, I give a Place to the Instrument in my List. See p. 9. No. 8.

No. 9. The BLOCK PLOUGH improved, for four Cattle to draw double, compleatly mounted with Beam-plates and Screw-bolts, Mold-board, Side and Bottom plated with Iron; the Beam and Cross united by a thorough Screw-pin, double Bands and Iron Wedges, Rider and Screw-bolt, a screw Staple, Hook and Washes, Collar, Bolts, Keys and Hook; a strong steeled Coulter and an Iron Share of a new Pattern. 2*l.* 10*s.* For its Use, see p. 9. No. 9.

No. 10. The CHIP PLOUGH, mounted in the same Manner. 2*l.* 10*s.* See p. 10. No. 9.

No. 11. The HUNTING PLOUGH, with an Iron Chip, the Cattle to draw single, mounted in the same Manner. 2*l.* 10*s.* See p. 10. No. 11.

No. 12. The BAITING PLOUGH, mounted in the same Manner, with a wrought Iron steeled Share. 2 Guineas and an half. See p. 10. No. 12.

No. 13. The ESSEX PLOUGH, *i. e.* a Plough to work with two Cattle, both a-breast, and the Ploughman to drive, mounted in the same Manner. 2 Guineas. See p. 10. No. 13.

No. 14. The LOMAX PLOUGH, for four Cattle to draw double, mounted in the same Manner. 2*l.* 10*s.* See p. 11. No. 14.

No. 15. The LOMAX PLOUGH, for two Cattle to draw single, mounted in the same Manner. 2 Guineas. This is what I call my Seeding Plough. See p. 11. No. 15.

N. B. The Swingle Tree, No. 6, is necessary to work this Plough.

No. 16. The GARDEN PLOUGH, mounted in the same Manner as No. 3. 1*l*. 14*s*. 1½. This is a Plough of the same Make, calculated for one Horse. See p. 12. No. 16.

N. B. No. 6, is necessary to work this Plough.

No. 17. A large strong Plough, mounted in the same Manner as No. 9, and of the same Make, calculated for ploughing from twelve to eighteen inches deep, and to be drawn by any Number of Cattle from eight to sixteen. 3 Guineas. See p. 12. No. 17.

No. 18. The TURN-WHIST, or Kentish Plough with or without Wheels. See p. 12. No. 18. The latter 3 Guineas.

No. 19. MR. TULL'S Four Coulters Plough. See p. 13. No. 19.

No. 20. The HERTFORD-SHIRE, or double Wheel Plough. See p. 13. No. 20.

No. 21. The OXFORD-SHIRE, or single Wheel Plough. See p. 13. No. 20.

No. 22. SLEDGES for four-horse Ploughs, shod with Iron. 10*s*. See p. 13. No. 22.

No. 23. SLEDGES for two-horse Ploughs, shod with Iron. 7*s*. See p. 13. No. 22.

No. 24.

No. 24. PLOUGH HAMMERS. 3s. 9d¹.

No. 25. PLOUGH PADDLES. 1s. 7¹/₂.

No. 26. The DRAIN PLOUGH, to mark out Drains of different Diameters, mounted with a Spok-wheel, bound with Iron, Iron Axis, double Wheels behind, plated Sliders, Swivels, Staple, Bolt Key and Lip; twelve strong Plates bedded in the Beams, Body Screw-bolts, Brackets and Screw-bolts, thorough Screw-bolts to hind Axis, two strong steeled Coulters and Iron Wedges, with Swingle-trees and Chain, mounted. 5 Guineas. See p. 14. No. 26.

No. 27. The SCARIFICATOR, with four Coulters, for taking Moss off Meadow Land, and otherwise improving it, mounted with a Spok-wheel bound with Iron, double Wheels behind, two Iron Axletrees, double Iron Brackets, plated Sliders, swivel Staple, swingle-tree Brogues and Loops, five steeled Coulters, their Holes double plated and the Table-screw bolted. 4 Guineas. See p. 14. No. 27.

No. 28. The SCARIFICATOR DRAIN PLOUGH, being a Scarificator and Drain Plough comprized in the same Instrument, mounted with Body-bolts, Brackets and Screw-bolts, a Spok-wheel bound with Iron, and an Iron Axis, two hind Wheels, thorough Screw Bolts and Brackets to the hind Axis, plated Sliders, swivel Staple, Bolt, Key and Lip; twenty-two strong Plates bedded in the Beams; two strong steeled Coulters for marking out Drains, and seven steeled Coulters for the Purpose of Scarifying Meadow Land; Wedges, Swingle-trees, Swivel Chain, Brogues, Loops, &c. 6 Guineas. See p. 14. No. 28.

No. 29. The DITCHING PLOUGH. This Instrument is mounted in the same Manner as No. 4, with the Addition of Beam-plates, and is an Instrument of the same Kind, only that it is much stronger. 40s. See p. 14. No. 29.

N. B. This Instrument is to be worked with the Horses one before the other, and therefore requires a single Swingle-tree, No. 6, and which is to be ordered, if required with it.

No. 30. SWINGLE-TREES which are for drawing double, and a Swivel Chain, Brogues, Loops and Rivets. 12s. and without a Chain, 9s. a Set.

No. 31. A LARGE HARROW upon Wheels, a new Instrument. See p. 14. No. 31.

No. 32. HARROWS for two, and four Horses, with Chains, and affixed to a Carriage, with a Pair of Wheels and Shafts. See p. 14. No. 31.

No. 33. The TRIANGULAR PLOUGH-HARROW, for the reducing Ground; strong Bulls, Iron-plats affixed with Screw-bolts, Anchor-pins, steeled, nutted and screwed; Collar-bolts, Keys and Hook. 5 Guineas. See p. 14. No. 31.

No. 34. DOUBLE HARROWS for four Horses, eight Bulls mounted with square Pins, coupling Screw-bolts and Nuts, screwed Staple and Hook. 3 Guineas. See p. 14. No. 31.

N. B. I have lately rivetted the Bulls of some of these Harrows, on each Side of every Pin Hole, which prevents their being split, in driving the Pins by a careless Hand. That additional Work, adds to the Price 8s. 4d. and therefore, Gentlemen who order them, will please to specify whether they would have them rivetted or not.

No. 35. DOUBLE HARROWS for two Horses, mounted in the same Manner: 3l. See p. 14. No. 31.

N. B. When rivetted, that adds to the Price, 6s. 8d.

No.

No. 36. The SLEDGE for the four-horse Harrows, shod with Iron, Chains, Hooks, suspending Hooks and Staples, and Iron Lid to the Box for the coupling Pins of the Harrows and Keys. 16s. 3d. See p. 13. No. 22.

No. 37. The SLEDGE for the two-horse Harrows, mounted in the same Manner. 14s. See p. 13. No. 22.

No. 38. The TRIANGULAR PLOUGH HARROW, for one or two Horses, chiefly for Peas.

No. 39. GARDEN HAND HARROWS.

No. 40. FLAX HARROWS.

No. 41. SLEDGES and TRUCKIES of every Construction, for Ploughs, Harrows, Bushes, Timber, Sacks of Corn, Lead, &c. See p. 13. No. 22, &c.

No. 42. WAGGONS with either broad or narrow Wheels, finished in the compleatest Manner. See p. 15. No. 42.

No. 43. CARTS with three Wheels three Inches broad, for one or two Horses; with a framed Bottom, Compass Shaft Slats and Screw Bolts, and compleatly mounted with strong Stock-bands, Sand-pans, Buttons and Pins, Cuttoos affixed with Screw-bolts, strong counter-sunk Hinges and Screw-bolts, and strong Shaft-straps; strong Iron Standards, screwed and nutted; Iron Tail-pins and Chains; Iron Tail-board Lips and Bolts; Tuck-pins, Chains and Staples, double-twisted swivel Back-band, Staples and Hook; a strong Iron-sword, Screw-bolt and Staple; strong Hurters, Iron Trap-bolt, Staples and Screw-shaft Staples, strong and full sized Tire on the Wheels, counterfunk and put on with Screw-bolts; Fore-carriage mounted with strong treble Iron-bows, Screw-bolts, Centre-pin and Keys, Gudgeons, Gudgeon-hurters and Gudgeon-brackets, affixed with Screw-bolts and strong Shaft-bolt, &c. 11 Guineas. See p. 15. No. 42.

F 4

No. 44.

No. 44. The same CARRIAGE, mounted with Iron Arms, affixed with Screw-bolts and Screw-staples. 12 Guineas. See p. 15. No. 42.

No. 45. The same CARRIAGE, with six-Inch Wheel, Wooden Axle-tree. 13 Guineas. With Iron Arms, 14 Guineas. See p. 15. No. 42.

No. 46. The same CARRIAGE with nine-inch Wheels, Wooden Axle-tree. 15 Guineas. With Iron Arms, 16 Guineas.

N. B. Where the Tire for these Wheels shall be chosen of thin Iron for Lawns, the Price will be less in Proportion to the Quantity of Iron abated. See p. 15. No. 42.

No. 47. TWO-HORSE CARTS, with a framed Bottom, Compass Shaft-flats and Screw-bolts, and completely mounted with strong Stock-bands, Sand-pans, Buttons and Pins; Cuttoos affixed with Screw-bolts, strong Hurters, strong counter-funk Hinges and Screw-bolts; strong Shaft-straps, strong Iron Standards, nutted and screwed; Iron Tail-pins and Chains; Iron Tail-board Lips and Bolts; Tug-pins, Chains and Staples; double-twisted twivled Back-bands, Staples and Hook; a strong Iron-sword Screw-bolt and Staple; Iron Trap-bolt, Staples and Screw-shaft Staples; strong and full sized Tire on the Wheels, counterfunk and put on with Screw-bolts, &c. 12 Guineas. And mounted with Iron Arms, 13 Guineas. See p. 15. No. 42.

No. 48. ONE-HORSE CARTS, mounted in the same Manner as No. 47. with Wooden Axle-trees, 7 Guineas. With Iron Arms, 8 Guineas. See p. 15. No. 42.

No. 49. The FARMER'S CART for one Horse, mounted in the same Manner as No. 47, and with Iron Arms, and the Addition of Top-railing, calculated for drawing

drawing Hay, Straw, Corn in Sheaf or Sacks of Corn, Dung, Earth, &c. 7 Guineas. See p. 15. No. 42.

No. 50. A TURF CRADLE, for drawing Turf, or Grass, fitted to this Cart, No. 49; to be put on and taken off occasionally. One Guinea.

No. 51. BOMB CARTS of any Size.

No. 52. SMALL CARTS, of a new Construction, for Lawns or Grass Walks, which will not cut the Sod.

No. 53. WATER-CARTS of any Construction, either to fill themselves, or to be filled by Hand or Pump.

No. 54. LOW-BACKED CARS of a new Construction, mounted with Spoke Wheels, and bound with Counter-sunk Tire put on with Screw-bolts, Iron Arms put on with Screw-bolts, Wing-brackets and Screw-bolts, Tug-pins and Chains, double-twisted swiveled Back-band, Hook and Staples, 5 Guineas. When a double Centre Bracket, moulded Brackets behind, Shaft Brackets, and Shaft Lining, all firmly affixed with Screw-bolts, a Drag-staff hung on a Swivel, Screw Staple and suspending Chain, Cuttoos, Sand-Pans, Buttons and Pins, Tug-Pins and Chains are added, then the Price is 6 Guineas. See p. 16 to 22.

No. 54.

No. 55. LOW-BACKED CARS, of a second Kind, mounted with Spoke Wheels and Iron Arms. 4 Guineas and an half.

N. B. This Car moves upon the same Principles, and works as easy as the above, No. 54, but is not so fortified with Iron and Screw-bolts, being calculated for Persons who cannot afford to pay for the Best. A Turf Cradle may be fitted to this also.

No. 56. SIDE-BOARDS, HEAD-BOARD, TAIL-BOARD, fitted to either of the above Cars, and mounted, with coupling Irons, Iron Brackets and Screws, with

with Iron Tail-pins, Chains and Staples, for drawing Dung, &c. 16s. 3d.

No. 57. A TURF CRADLE, for drawing Turf, suited to either of the Cars, to be put on and taken off occasionally, one Guinea. See p. 22.

No. 58. COACH, POST-CHAISE, CABRIOLE, and other WHEELS.

No. 59. SPOAKED WHEEL BARROWS of a neat and strong Kind. Half a Guinea a Piece.

No. 60. WHEEL BARROWS, for Gardens, with Broad-Rollers, for the Preservation of the Walks. 16s. 3d.

No. 61. WATER-BARROWS, for Gardens, with a Pair of Wheels of a new and compleat Kind. 3 Gu.

No. 62. LARGE WHEEL BARROWS, for Stables or Gardens, with a Spok Wheel, and Iron Brackets. 17s. 4d.

No. 63. The same BARROW, with an Hollow Roller, shod with Iron, and Iron Brackets for Gardens. 20 Shillings.

No. 64. A STABLE BARROW, with a Pair of three Feet Spok Wheels, shod with Iron, an Iron Axle-tree, and in every Respect made like a Cart, except that of having Handles for a Man to wheel it, instead of Shafts for an Horse. 4 Guineas.

No. 65. WEED-BARROWS for Gardens. 13s.

No. 66. GRASS-BARROWS for Soiling Plough Cattle when standing yoked in the Field. 13s.

No. 67. SHEEP-RACKS, of a compleat and new Construction, with Bevel Racks, running on Wheels, and Iron Arms. 3 Guineas.

No. 68.

No. 68. SHEEP-RACKS of a compleat and new Construction, with Perpendicular Racks, running on Wheels, and Iron Arms. 4 Guineas. Calculated to prevent Waste of Hay.

No. 69. FIELD-GATES of any Construction.

No. 70. GARDEN-SEATS, CHAIRS, and STOOLS, of various Kinds.

No. 71. ROLLERS for Corn and Meadow, of a compleat and new Construction.

No. 72. SPIKED-ROLLERS of any Construction,

No. 73. A ROLLER for reducing Fallows, be they ever so stubborn.

No. 74. FANNERS for Winnowing Corn in the Barn, when the Wind does not serve to Winnow out of Doors, or in the Passage of the Barn Doors. 3 Guineas and half.

No. 75. BRASS-WIRE-SIEVES for Corn and Seeds.

No. 76. HAY-RAKES, of a strong and neat Kind, 19s. 6d. per Dozen.

No. 77. IRON RAKES of various Kinds.

No. 78. HAY-FORKS, Handles, Ferrils, and Rivets neatly mounted, 2s. 8d $\frac{1}{2}$.

No. 79. HAY-PITCHING FORKS, with long Handles, Ferrils, Head, and Rivets, 3s. 9d $\frac{1}{2}$.

No. 80. THREE-PRONGED FORKS for Dung, compleatly mounted. 5s. 5d.

No. 81. THREE-PRONGED FORKS, for raising Stones or Rubbish out of Gardens. 5s. 5d.

No. 82.

No. 82. DRAG-FORKS, for unloading Dung in small Heaps on Land. 3s. 3d.

No. 83. DOCK-IRONS, for pulling up the Roots. 7s. 6d.

No. 84. The BRIER-DOG, with polished Cheeks, screw-bolted Arm, Block double-hooped, and double-banded Lever, for pulling up Thorns, &c. by the Roots. 1l. 14s. 1d $\frac{1}{2}$.

No. 85. The STUMPING-IRON, for compleatly taking the Beards off Barley with Expedition. 13s.

No. 86. ENGINES for cutting Hay and Straw for Horse-Meat.

No. 87. VENTILATORS for Hay-Ricks, by which the Hay may be saved without putting it in Tramp-Cocks.

No. 88. BEE-HOUSES and BOXES, for taking the Honey and Wax, without killing the Bees, consisting of an House, and six Otagon Boxes, for two Colonies. 7 Guineas. See p. 23. No. 88.

No. 89. CRIBS of a neat and new Construction for foddering Black Cattle. See p. 23. No. 89.

No. 90. The TURNIP SLICING ENGINE, a new Instrument for slicing Turneps for Black Cattle. See p. 23. No. 90.

No. 91. The STUBBLE HORSE-RAKER, calculated for pulling up and gathering Stubble at one Operation, where the Corn shall have been sown flat, either under the Harrow or Plough.

No. 92. The BROAD-CAST TURNIP HORSE-HOE, an Instrument for thinning and horse-hoeing Broad-cast Turneps.

No. 93.

No. 93. A Gentleman's WALKING POLE, six Feet long, with Brass Figures upon it, and Variety of neat and useful Tools, to put upon the Staff occasionally. 16s. 3d.

No. 94. BULLOCK HAMES, of a strong and neat Kind. 4s. 4d. a Pair.

No. 95. BILL HOOKS, home made, and well steeled and tempered. 2s. 2d.

No. 96. A STRETCHER for TRACES. 2s. 2d.

No. 97. TRACES of different Kinds, from 8s. 8d. to 11s. 4d. $\frac{1}{2}$ a Pair.

No. 98. LONG PLOUGH CHAINS, short Links, 9s. 9d. Short Plough Chains, 3s. 9d. $\frac{1}{2}$

No. 99. HORSE-HAMES, of strong compleat Kinds, for Ploughs and Carriages, from 6s. 6d. to 8s. 1d. $\frac{1}{2}$ a Pair.

No. 100. SUSPENDING-CHAINS for Ploughs, 3s. 6d. per Pair.

The LIST of LEATHER-HARNESS.

BRIDLES, of various KINDS.

No. 101. The very best *English* front Bridles, with Face Piece, Nose Piece, and Star Piece, elegantly ornamented with Work, lettered and dated, and furnished with Fringe, Bobs, Tossels and a Pair of Bells, and two Pair of Reins. 14 15s. 6d.

No. 102. The same Bridle, compleat, without Bells. 14 8s.

No. 103. The same Bridle, compleat, without Bobs, Tossels, or Bells, 11. 5s.

No. 104.

No. 104. The same Bridle plain, without ornamental Work, Bobs, Tossels, or Bells, only bound, lettered and dated. 17s. 4d.

No. 105. The same Bridle, quite plain, without any ornamental Work, Letters, Date, Bobs, Tossels, or Bells. 14s. 6d.

No. 106. The very best Winker Bridles, lettered and ornamented with Work, the Front handsomely lapped, with Stays and Buckles to the Winkers, Tossels and double Reins. 14s. 6d.

No. 107. The same Bridle without Tossels, and with double Reins. 11s. 4d. $\frac{1}{2}$

No. 108. The same Bridle, neatly bound with Red *Morocco* Leather, lettered, without Tossels, and with single Reins. 8s.

No. 109. Neat Winker Bridles, single Reins. 6s.

N. B. All the above Bridles, are mounted with strong home-made polished Bits, and made of the best tanned Cow Leather, Black, that they may be kept clean, like Coach Harness, unless people chose them Brown.

No. 110. Common White *Irish* Winkers, from 14d. to 19d. $\frac{1}{2}$ a Pair.

NECK-COLLARS, for HORSES and BULLOCKS.

No. 111. The very best *English* tanned Cow Leather Neck Collars, double welted and bound, lined with soft Leather or Swan Skin, to absorb Sweat, faced with curled Hair, and mounted with large Housings, and that compleatly fringed, lettered, and elegantly ornamented with Work. 1l. 5s.

No. 112.

No. 112. The same Collar, with Housing, neatly lettered and fringed. 16s. 3d.

No. 113. The same Collar, with Housing, neatly lettered, and bound with Red *Morocco* Leather. 13s.

No. 114. The same Collar, without Housing. 9s. 9d.

No. 115. Good *English* tanned Leather Collars, lined with Linen, double welted, faced with curled Hair and Wool, and handsome plain Housing, neatly bound. 11s. 4d. $\frac{1}{2}$

No. 116. The same Collar, without Housing. 7s. 6d.

No. 117. Plain *English* tanned Leather Collars, single welted, lined with Linen, faced with curled Hair and Wool, and with plain Housing. 8s. 8d.

No. 118. The same Collar, without Housing. 5s. 5d.

No. 119. Plain *English* Collars, made of White Leather, lined with White Linen, and faced with Wool. 5s. 5d.

N. B. These White Collars are chiefly for working in Mines, where the White Leather, from the Manner of its being manufactured, will last considerably longer than any tanned Leather, as Experience hath shewn in the Mines of *England*.

No. 120. The best hairy Collars, double welted, faced with curled Hair, lined with Linen, double bolstered, and made like *English* Collars. 4s. 6d.

No. 121. Best *Irish* hairy Collars, lined with Ticken, faced with Hair and Wool, and covered with Side Pieces. 3s. 3d.

No. 122. The same Collar, lined with Ticken, and faced with Wool. 2s. 9d.

No. 123.

No. 123. The same, lined with Ticken, without Side Pieces, and stuffed with Straw. 2s. 2d.

No. 124. Best Collars for Plough Bullocks, made very large and full, double welted and double bolstered, faced with Hair and Wool. 7s. 6d.

No. 125. A cheaper Kind, at 5s. 5d.

N. B. I shall just observe here, for the Information of the Reader, that the Manner of making all these Collars, in the Part next the Throat of the Horse, for the greater Freedom of his Breathing, differs from the Manner practised in Ireland, in the Construction of Collars; which not being attended to, by the Collar-Makers here, (perhaps from the miserable Kind of Work which they find the greatest Demand for) we thence, so frequently, hear a poor Animal, in an hard Draft, blowing as if his Wind is broke, from the Pressure of the Collar upon his Windpipe, although he be a sound Horse in that Respect. And I have had some of my Horses, which were good Cattle, sound, and in good Order, fall to the Ground under their Burthen, from this Circumstance. And Gentlemen cannot but have observed Carmen, (*more particularly when the Cattle have been their own*) frequently upon the Road, run in great Haste to stop their Horses, as soon as they hear them begin to blow, because they well know the Consequence, if the Horses are not stopped. And how pitiable a Case it is, that so valuable and generous a Creature, struggling in the Execution of his Office, even against the Pain of Strangling, by the Inaccuracy of constructing any Part of his Accoutrements, should be so near expiring, as to fall under his Burthen, Humanity will suggest.

The Housing to Collars, is not only ornamental, but useful; for it prevents the Rain running between the Collar and Shoulders of the Horse, where he is very apt to be injured, when the Housing is not used.

When

When Gentlemen order any Collars of me, they will please to let me know whether their Horses be large or small.

No. 126. Best Jockey Collars, faced with curled Hair, and lined with soft Leather, or Swan Skin. 6s. 6d.

No. 127. Common ditto. 5s. 5d.

No. 128. Best Chaise Collars. 6s. 6d.

No. 129. Common ditto. 5s. 5d.

CART-SADDLES, or STRADDLES.

No. 130. The very best *English* Cart Saddles, the Tree completely plated with Iron, and furnished with double Housings; those put on with Brass Nails, and elegantly lettered and ornamented with Work, the Pannel of tanned Leather, and lined with Hair; a broad Crupper neatly worked, and double-tongued Buckle; a worked Leather Pad to the Crupper, a Girth, and an Iron Spring on the Tree, to prevent the Back-band of the Carriage flying out, and a Swan Skin Saddle Cloth bound. 2l. 2s.

No. 131. The same Cart Saddle, with *Roman* Letters and Date on the Housings, and those bound with Red *Morocco* Leather, but no Saddle Cloth. 1l. 14s. 1d. $\frac{1}{2}$

No. 132. Good plain *English* Cart Saddle, with plain Housings, without Iron Plates or Spring, faced with curled Hair, and a broad Crupper and Pad. 1l. 2s. 9d.

No. 133. Good plain *English* Cart Saddles, with a broad Crupper and Pad, lined with Swan Skin, and faced with curled Hair, neatly finished. 17s. 4d.

A LIST of the

No. 134. Good plain *Englisb* Cart Saddles, neatly finished, and narrow Crupper. 11s. 4d. $\frac{1}{2}$

No. 135. Plain *Englisb* Cart Saddles, without Cruppers. 7s. 6d.

No. 136. Best *Irish* Cart Saddles, faced with Stuffing, and the best jointed Trees. 4s. 6d.

No. 137. Another Kind of ditto. 3s. 9d. $\frac{1}{2}$

No. 138. The Common ditto. 2s. 8d. $\frac{1}{2}$

No. 139. Block Cart Saddles, of all Kinds.

N. B. Here I shall observe, that Care is taken in the Stuffing these Cart Saddles, that the Pannel rises before and hind, so as not to press upon and wound the Horse, as is generally the Case with those I have bought here, from the Pannel not being properly cut or stuffed.

B E L L Y - B A N D S.

No. 140. Best *Englisb* Belly-bands, with double tongued Buckles, neatly worked and ornamented, for the Shafts of Carts or Cars, to prevent the Carriage rising in ascending an Hill, or when the Load has been injudiciously put on too far behind. 7s. 7d.

No. 141. Plain Belly-bands for the same Purpose, with double Buckles. 5s. 5d.

No. 142. The same, for large Carriages, lined with Leather and worked. 11s. 4d. $\frac{1}{2}$

No. 143. Plain Belly-bands for Horses or Bullocks in Ploughs, or leading Horses in Waggon or Carts, from 2s. 2d. to 3s. 3d.

No. 144.

No. 144. Linked Belly-bands, double capped, and lined up, for Waggon or Carts. 4s.

BRITCHENS.

No. 145. Best *Englsh* Britchens, double Hip Straps, compleatly finished, and elegantly ornamented with Work. To prevent a Carriage running upon an Horse or Horses, which are in it, in descending an Hill, or to enable the Horse in the Shafts to back the Carriage. 14s. 6d.

No. 146. The same Britchen, neatly finished, but not ornamented with Work. 12s.

No. 147. Best *Irisb* Britchens, neatly made. 8s. 6d.

BACK-BANDS.

No. 148. Broad Back-bands, with double-tongued Buckles and Leather Pads, neatly worked and stuffed, for Ploughs. 8s. 8d.

No. 149. Broad Back-bands, with double Buckles and common Pads, for Ploughs. 6s. 6d.

No. 150. Narrower Back-bands, with single Buckles, and without Pads, for Ploughs. 4s. 6d.

No. 151. Broad Noose Back-bands, with worked Pads and Toffils, and handsomely ornamented, for the leading Horse or Horses, in Waggon or Carts. 9s. 9d.

No. 152. The same Back-bands, plain, with common Pads. 6s. 6d.

No. 153. The same Back-band, with double Iron Links instead of Nooses, with worked Pads and Toffils. 9s. 9d.

G 2

No. 154.

No. 154. The same Back-band, with single Iron Links, and common Pads. 6s. 6d.

BACK-CRUPPERS.

No. 155. Back Cruppers and Hip Straps, for the leading Horses in Waggon or Carts, handsomely worked, ornamented and fringed. 9s. 9d.

No. 156. The same plain, for Ploughs, Waggon, or Carts. 7s. 7d.

TRACE PIPES.

No. 157. Best tanned Leather Trace Pipes, for Waggon, Carts, or Ploughs. 5s. 5d. a Pair.

No. 158. Common ditto, neatly closed. 3s. 6d. a Pair.

No. 159. Common ditto, *Irish*. 2s. 8d. $\frac{1}{2}$ a Pair.

English WHALE-BONE WHIPS, &c.

No. 160. Best *English* Waggon Whalebone Whips, 9 Feet long. 9s. 9d.

No. 161. The same, for two or three Horse Carts, 7 Feet long. 7s. 7d.

No. 162. The same for driving Ploughs, 6 $\frac{1}{2}$ Feet long. 6s. 6d.

No. 163. The same for a one Horse Carriage, 5 Feet long. 5s. 5d.

No. 164. An Elastick Whalebone Bullock Goad. 6s. 6d. I have been induced to think of this Article, from the Pain I have felt, at frequently seeing the Drivers

Drivers of Ploughs, unmercifully stabbing the Bulls with a Nail, (commonly called a Prod) put into the End of a stubborn Stick, often to the great Pain of the Animal and Injury of its Owner: Circumstances, which cannot happen in the Use of this Goad.

SUNDRY ARTICLES.

No. 165. Straps for Hames, with a Buckle. 4*d*.

No. 166. Horse Nets, for Ploughs, Waggon, or Carts.

No. 167. Muzzles, made of the best tanned Leather, for Stallions, or Horse-hoeing drilled Crops. 4*s*. 4*d*.

No. 168. *Dutch* Head Collars or Halters, for Stables, with double Leather Reins. The best Kind. 6*s*. 6*d*.

No. 169. The same, such as are generally made. 5*s*. 5*d*.

No. 170. The same, with two Iron-linked Reins,

No. 171. The same, with single-linked Reins. 6*s*.

No. 172. The same, with a single Leather Rein. 4*s*.

No. 173. Common Head Collars, with single Reins. 2*s*. 8*d*.¹/₂

No. 174. White Jocky Collars, from 13*d*. to 16*d*.

No. 175. Best *English* Hedging Mittens, welshed. 3*s*. 3*d*. For defending the Workman's Hand, in splashing or cutting Hedges, Faggots, or Furz.

No. 176. Common ditto. 2*s*. 2*d*.

No. 177. Millers and other Pads, in the *English* Form, for carrying Sacks on an Horse's Back.

No. 178. *Englsh* Hamper Pads, for carrying Hampers on an Horse's Back, with Straps and Bolsters.

No. 179. Hood Winks, for Horses in Mills or Pastures, from 2s. 2d. to 2s. 8d. $\frac{1}{2}$ a Pair.

No. 180. Bullock Suggons, of Bull-rush and Gadded, from 14d. to 16d.

No. 181. Nossils and Tuggs, for a Shaft Horse to draw by, instead of Iron Chains and Rings, which I find injure the Shafts greatly, often the Collars, and sometimes the Horse. These are made of the best tanned Cow Leather, lined, handsomely worked, and with double tongued Buckles. 8s. 8d. a Pair.

No. 182. The same, made with white or hairy Leather, quite plain, and no Buckles. 5s.

No. 183. Black Leather Caps of different Kinds, for Ploughmen, Plough-drivers, Carmen, Waggoners, Post-Chaise Boys, or Laborers.

No. 184. Black Velvet Caps, for Gentlemen or Farmers, of any Kind.

No. 185. Saddles and Bridles, made in the *Englsh* Manner, of various Kinds.

No. 186. Side Saddles of all Kinds.

No. 187. *Englsh* Pads of all Kinds, for Women.

No. 188. Pillions of all Kinds, and Pillion Cloaths.

No. 189. Mail Pillions.

No. 190. Leather Bags and Portmanteaus.

No. 191. Watering Bridles, for Coach-Horses.

No. 192. Coupling Reins, from 19d. $\frac{1}{2}$ to 2s. 2d.

The

The last Number having finished my List, I shall now, for the Convenience, and readier Information of Gentlemen, who may wish to supply themselves with compleat Sets of Instruments *for Tillage*, endeavour to state distinct Tables, of Sets of Ploughs, and their necessary Appurtenances; with Sets of Harness, and their Appurtenances: And as the latter differs in Price, so I shall give distinct Tables thereof, referring by the respective Numbers, to the Articles in the List at large, as I have done in the Harness for the Drill Husbandry, in p. 26. No. 7. And all these distinct Sets I shall distinguish under the Letters of our Alphabet, beginning with the Letter A. So that when any Person means to have a compleat Set or Sets of any of the following Articles, he will please to name the *Letter*, under which the Column stands, and the Number of Sets he would have, of the Article or Articles that he may want; and I shall, thereby, instantly know the Kind he would have, in Point of Quality. And this Method will be essentially necessary to be observed, in the ordering Harness for any particular Purpose.

A Set

A Set of Ploughs, for four Horses or Bullocks, for making Fallow, and for sowing Corn, either in small Ridges, or in Broad Sets under the Plough, with their necessary Appurtenances, *viz.*

	A.			B.			C.			D.				
	No.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	
The Block Plough	9	at	2	10	0	2	10	0	2	10	0	2	10	0
The Lomax, or Seeding Plough, to draw fingle, wider in the Sole than the following,	15	2	5	6	2	5	6	2	5	6	2	5	6	
The same Plough, narrower in the Sole than the above, and why. See Page 11 and 28. No. 15.	15	2	5	6	2	5	6	2	5	6	2	5	6	
The Sledge for the Block Plough,	22	0	10	0	0	10	0	—	—	—	—	—	—	
Two Sledges for the Seeding Ploughs,	23	0	7	0	0	7	0	—	—	—	—	—	—	
Two Plough Hammers,	24	0	3	9½	—	—	—	0	3	9½	—	—	—	
Two Plough Paddles,	25	0	1	7½	—	—	—	0	1	7½	—	—	—	

The Reader, it is presumed, will immediately see, that if he would have all the Articles, he is to order the Column A. If no Hammers or Paddles, the Column B. If no Sledges, the Column C. And if neither Sledges, Hammers, or Paddles, the Column D.

A Set

A Set of Harrows, for four Horses, or Bullocks; for the Purposes of reducing Ground, and sowing Corn under the Harrow, with their necessary Appurtenances, viz.

	A.			B.			C.		
	No.	l	s. d.	l.	s. d.	l.	s. d.	l.	s. d.
One Pair of four Horse Harrows,	34	at 3	16 7	at 3	8 3	at 3	8 3		
Two Pair of two Horse Harrows,	35		3 6 8		3 0 0		3 0 0		
A Sledge for No. 34.	36		0 16 3		0 16 3		0 0 0		
Two Sledges for No. 35.	37		0 14 0		0 14 0		0 0 0		
One Set of Swingle-trees, with a } short Chain,	30		0 12 0		0 12 0		0 12 0		

The Reader will observe, that in the Column A, the Harrows are to be rivetted B, not rivetted, both the Sets having the proper Sledges, but in the Column C, the Harrows will not be rivetted, neither are the Sledges included in that Column The Swingle Tree, No. 30, are necessary to the working the second two Horse Harrow:

A Table

A TABLE, containing compleat Harness for four Horses, of different Qualities, in four distinct Columns, referring by the Numbers, to the respective Articles in the preceding List.

Names of the ARTICLES.	A.			B.			C.			D.		
	No.	s.	d.	No.	s.	d.	No.	s.	d.	No.	s.	d.
Four Bridles, — — —	107	at 11	4½	108	at 8	0	108	at 8	0	109	6	0
A Pair of Coupling Reins, — —	102	2	2	192	2	2	192	1	7½	—	—	—
Four Neck Collars, — — —	115	11	4½	116	7	6	120	4	6	121	3	3
Four Hame Straps, — — —	165	0	4	—	0	4	—	0	4	—	0	4
Four Back-bands, — — —	148	8	8	148	8	8	149	6	6	150	4	6
Four Belly-bands, — — —	143	3	3	143	2	2	143	2	2	143	2	2
Four Back Cruppers and Hip Strap,	156	7	7	156	7	7	156	7	7	—	—	—
Four Pair of Trace Pipes, — —	157	5	5	157	5	5	158	3	6	159	2	8½
Four Pair of Collar Hames, — —	99	6	6	99	6	6	99	6	6	99	6	6
Four Pair of Traces, — — —	97	11	4½	97	10	10	97	10	10	97	8	8
One Long Plough Chain, — —	98	9	9	98	9	9	98	9	9	98	9	9
One Pair of suspending Chains,	100	3	6	100	3	6	100	3	6	100	3	6
One Set of Swingle-trees, and a short } Plough-Chain, — — —	30	12	0	30	12	0	30	12	0	30	12	0
One Set ditto, without a Chain,	30	9	0	30	9	0	30	9	0	30	9	0
One Whale-bone Whip, — —	162	6	6	162	6	6	—	—	—	—	—	—

N. B. Thus, four Horses are furnished with compleat Tackling, by which they cannot be cut or hurt; for working the four Horse Plough, No. 9. The four Horse Harrows, No. 33. The two Seeding Ploughs, No. 15, and the two Horse Harrows, No. 34. Only with this Difference, that when the compleat Set of Ploughs, A, are ordered, with any one of these Columns of Harness, A, B, C, or D, that two Pair of the Traces will be made longer than would be necessary for working four Cattle to the Plough No. 9, only, and these two longer Pair of Traces are for the leading Horses, in working the Ploughs, No. 15. The same Rule will be observed in the Harness for four Bullocks, (which follow in the next Tables,) when the Set of Ploughs, A, shall be ordered with Harness. But when only a four Horse Plough and Harness shall be ordered, then the Traces will be all of a Length.

A TABLE,

The same Rule will be observed in the harnesses for four Bullocks, (which follow in the next Column) But when only a four Horse Plough and Harness the Set of Ploughs, A. shall be ordered with Harness. But when only a four Horse Plough and Harness shall be ordered, then the Set of Ploughs shall be ordered with Harness.

Ailities, in eleven distinct Columns, regarding Lift, viz.

	H.			I.			K.			L.				
Name	s.	d.	No.	l.	s.	d.	No.	l.	s.	d.	No.	l.	s.	d.
One B	8	0	108	0	8	0	108	0	8	0	109	0	6	0
One N	7	6	118	0	5	5	120	0	4	6	121	0	3	3
One O	17	4	134	0	11	4½	135	0	7	6	136	0	4	6
One S	5	5	141	0	5	5	—	—	—	—	—	—	—	—
One B	12	0	147	0	8	6	—	—	—	—	—	—	—	—
One P	8	1½	99	0	8	1½	99	0	8	1½	99	0	8	1½
Nossils	—	—	—	—	—	—	—	—	—	—	—	—	—	—
One H	0	4	165	0	0	4	165	0	0	4	165	0	0	4
One V	—	—	—	—	—	—	—	—	—	—	—	—	—	—
One H	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Things of Harness for an Horse, in a one Horse Carrier their respective Column, referring by the Number Thing that can be wanting, for completely furnishable, to which I thought it unnecessary to give a Place in a flat Country, though always very Useful Whip, No. 163, or the Net, No. 166, be hand L, I have totally omitted these Articles. And

A TABLE, containing compleat Harnesses for four Bullocks, of different Qualities, under five distinct Columns, referring by the Numbers to the respective Articles in the preceding List, viz.

	A.			B.			C.			D.			E.		
Names of the ARTICLES.	No.	s.	d.	No.	s.	d.	No.	s.	d.	No.	s.	d.	No.	s.	d.
Four Bullock Suggons, — — —	180	at	1 4	180	1	2	—	—	—	—	—	—	—	—	—
* Or Four Neck Collars, — — —	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Four Back-Bands and Pads, — — —	148	8	8	149	6	6	—	—	—	124	7	6	125	5	5
Four Belly-Bands, — — —	143	2	2	143	2	2	—	—	—	148	8	8	148	8	8
* Four Hame Straps, — — —	—	—	—	—	—	—	—	—	—	143	2	2	143	2	2
Four Pair of Pipes, — — —	158	3	6	158	3	6	—	—	—	165	0	4	165	0	4
Four Pair of Bullock Hames, — — —	94	4	4	94	4	4	—	—	—	157	5	5	158	3	6
Four Pair of Traces, — — —	97	10	10	97	10	10	—	—	—	—	—	—	—	—	—
One long Plough Chain, — — —	98	9	9	98	9	9	—	—	—	97	10	10	97	10	10
One Pair of Suspendng Chains, — — —	100	3	6	100	3	6	—	—	—	98	9	9	98	9	9
One Set of Swingles, and short Chain, — — —	30	12	0	30	12	0	—	—	—	100	3	6	100	3	6
One Set ditto, without a Chain, — — —	30	9	0	30	9	0	—	—	—	30	12	0	30	12	0
One Elatlick Plough Goad, — — —	164	6	6	—	—	—	—	—	—	30	9	0	30	9	0
* Four Pair of Horse Hames, — — —	—	—	—	—	—	—	—	—	—	164	6	6	164	6	6
										99	6	6	99	6	6

Thus four Bullocks are furnished with compleat Tackling, by which they cannot be cut or hurt, for working the four Houfe Plough, No. 9, the four Horse Harrows, No. 33, the two Seeding Ploughs, No. 15, and the two Horse Harrows, No. 34. The Columns A, B, and C, contain the Harnesses for Bullocks to work with Suggons, No. 183, and so every Article diminishes in Price, from the Column A to the Column C, both inclusive. But as it is a much better and safer Method to work Bullocks in Collars, as we do Horses, I have named them in the Column of Articles, and marked them thus *, and carried them on to two other Columns, D and E, with all the other necessary Articles, diminishing in Price, from D to E; so whatever Quality any Person would have, he is to distinguish it by the Letter, at the Head of the Column he fixes upon.

A TABLE,

A T A B L E, containing compleat Harness for three distinct Columns, referring by the Numbers to the ref

	A.				B.			
Names of the ARTICLES.	No.	l.	s.	d.	No.	l.	s.	d.
A Bridle for the fore Horse, — —	101	1	15	6	102	1	8	0
Two ditto, for the two hind Horses, — —	106	0	14	6	106	0	14	6
Three Neck Collars, — — —	111	1	5	0	111	1	5	0
Two Pair of Hames, for the two fore Horses,	99	0	6	6	99	0	6	6
One Pair ditto, for the shaft Horse, — —	99	0	6	6	99	0	6	6
A Pair of Noffsils and Tugs, — — —	181	0	8	8	181	0	8	8
Three Hame Straps, — — —	165	0	0	4	165	0	0	4
Two Pair of Cart Traces, — — —	97	0	11	4½	97	0	11	4½
Two Stretchers, for the two fore Horses,	96	0	2	2	96	0	2	2
Two Pair of Trace Pipes, — — —	157	0	5	5	157	0	5	5
Two Back-Bands, for the two fore Horses,	151	0	9	9	148	0	8	8
Two Belly-Bands, for ditto, — — —	143	0	3	3	143	0	3	3
Two Back Cruppers, — — —	155	0	9	9	155	0	9	9
One Cart Saddle for the Shaft Horse,	130	2	2	0	130	2	2	0
One Shaft Belly-Band, for ditto, — —	142	0	11	4½	140	0	7	7
One Britchen, for ditto, — — —	145	0	14	6	145	0	14	6
Three Horse Nets, — — —	166	—	—	—	—	—	—	—
One Whale-Bone Whip, — — —	160	0	9	9	160	0	9	9

Thus I have endeavoured to range the different Qualities of Columns, so that by naming the Letter, at the Head of any one man would have. This Table will answer for two Horses in a

Horses in a Cart, of different Qualities, in six
pective Articles, in the preceding List, *viz.*

C.

D.

E.

F.

No.	<i>l.</i>	<i>s.</i>	<i>d.</i>	No.	<i>l.</i>	<i>s.</i>	<i>d.</i>	No.	<i>l.</i>	<i>s.</i>	<i>d.</i>	No.	<i>l.</i>	<i>s.</i>	<i>d.</i>
103	1	5	0	104	0	17	4	106	0	14	6	107	0	11	4½
107	0	11	4½	108	0	8	0	108	0	8	0	109	0	6	0
112	0	16	3	112	0	16	3	115	0	11	4½	116	0	7	6
99	0	6	6	99	0	6	6	99	0	6	6	99	0	6	6
99	0	6	6	99	0	8	1½	99	0	8	1½	99	0	8	1½
181	0	8	8	—	—	—	—	—	—	—	—	—	—	—	—
165	0	0	4	165	0	0	4	165	0	0	4	165	0	0	4
97	0	11	4½	97	0	11	4½	97	0	11	4½	97	0	11	4½
96	0	2	2	96	0	2	2	96	0	2	2	96	0	2	2
157	0	5	5	158	0	3	6	158	0	3	6	158	0	3	6
148	0	8	8	152	0	6	6	152	0	6	6	152	0	6	6
143	0	2	2	143	0	2	2	143	0	2	2	143	0	2	2
156	0	7	7	156	0	7	7	156	0	7	7	156	0	7	7
131	1	14	1½	131	1	14	1½	132	1	2	9	133	0	17	4
141	0	5	5	141	0	5	5	141	0	5	5	141	0	5	5
146	0	12	0	146	0	12	0	146	0	12	0	147	0	8	6
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
160	0	9	9	160	0	9	9	160	0	9	9	—	—	—	—

Harness, for three Horses in a Cart, under distinct
Column, I shall at once know the Kind any Gentle-
Cart, as Tackling for one may be omitted.

The

The Nature of this Undertaking is attended with such a constant Demand for ready Money, that I hope, whoever may favour me with their Commands, will not expect any Credit, as the Nature of the Undertaking will not admit of it.

It is requested of every Person who may send any Orders by Letter, that they will please to add the Number which is annexed to the Articles in the preceding List to such Instruments as they may please to order, which will effectually prevent any Mistakes. And also, to specify whether they would have any extra Coulters or Socks to such Ploughs as may be ordered; the latter will always be necessary, when the Ploughs are to go to any great Distance, because no other Socks will fit my Ploughs but my own Pattern; the Reasons for which, see Page 9, in my Explanation of the BLOCK PLOUGH, No. 9.

N. B. It has for some Time past been made a Practice to invite my Artificers to do what is called little Jobs for other Persons, inconsiderately, I am willing to hope; because a Moments Reflection would convince any Gentleman, that nothing can be more indelicate and unreasonable, not to use a severer Term, than privately, and to the Interruption of my Business, to call away Men whom I have imported, collected and instructed at a great Expence, whom I constantly maintain, together with their Families, and who are to return to me, when the Purposes of the Persons so inviting them are served. Some recent Instances of this Kind, added to many preceding Ones, obliges me to mention it thus publickly, which I hope will so effectually prevent a repetition of it, as to render it unnecessary for me to take any further Notice of it.

T H E E N D.

T H E I N D E X.

D.

DRILLED and Common Husbandry compared,
Page 23. 28. 30.

L.

Lucerne, Experiments on, 45
 Hay made of it, and Calculations on the Pro-
 duce, 56
 Dairy Cows fed with it, with various Experi-
 ments on that Point, 46
 Calculations thereon, 53

O.

Oats, Ground twice ploughed for, 16. 26
 Impediments to ditto, 22
 Ground once ploughed for, 20. 28
Oats, a Barrel, how much it is, Note, 21
Oats, sown to stand the Winter, 34
 Considerations on ditto, 40
 Sown in Spring, 34
Oats, a particular Kind, some account of them, 37

S.

Straw, injudicious to sell it, 15

W.

Wheat, second Crop in Drills, 9
 A Barrel, how much, Note, 13
 Injured by a Fly, 32

F I N I S.

EXPERIMENTS
IN
AGRICULTURE,

Made under the DIRECTION of

The RIGHT HONOURABLE and HONOURABLE
DUBLIN SOCIETY,

In the Year 1768.

To which is Added,

A PLAN for a NEW-CONSTRUCTED BARN.

By Mr. JOHN WYNN BAKER.

EXPERIMENTER in AGRICULTURE to the SOCIETY.

EV. 43

D U B L I N :

Printed by S. POWELL, for the AUTHOR.

A N D

Sold by G. FAULKNER, at the Corner of *Parliament-street*,
and the PRINTER hereof, in *Dame-street*.

M D C C L X I X.

12

T O T H E
RIGHT HONOURABLE and HONOURABLE
DUBLIN SOCIETY,

T H I S
R E P O R T
O F
EXPERIMENTS in AGRICULTURE,
IS GRATEFULLY INSCRIBED,

By their Faithful,

And most Devoted,

Humble Servant,

JOHN WYNN BAKER.

LAUGHLINSTOWN,
February, 1769.

A 2

INTRODUCTION.

On the 25th Day of *July*, 1765,

The RIGHT HONOURABLE and HONOURABLE

DUBLIN SOCIETY,

Were pleased to make the following
ORDER, *viz.*

“ **T**HAT it be recommended to Mr. *Baker*,
“ that with all convenient Speed, he will, a-
“ mong his Experiments in Agriculture, allot
“ a Portion of Ground, (not less than one Acre) for the
“ Culture of Wheat in Drills, Horse-hoeing the Inter-
“ vals; and that he also allot another Portion of Ground,
“ the same Quantity) for the Culture of Wheat in broad
“ Cast; that these two Portions of Ground lie as con-
“ tiguous to each other, and as much of the same sort
“ of Soil, as may be; that they be both sown with the
“ same Seed; and that Mr. *Baker* report his Obser-
“ vations, resulting from this Experiment, to the So-
“ ciety.”

In my Report for the Year 1765, I informed the Society and the Publick, how far I had proceeded in this comparative Experiment, between the Drill and Common Husbandry, in Obedience to the preceding Order,

In my Reports for the Year 1766, and 1767, I furnished an Account of the Produce of Corn and Straw, from each Method of Culture, in each Year; and also stated each Article of Expence, attending the two Methods of Culture, as it was incurred in the Practice, upon the given Quantity of Ground, in a clear and particular Manner.

Respecting the Treatment of the Acre of Ground, devoted to the Drill Husbandry in this comparative Experiment, it will appear, by referring to my Report for the Year 1765, Page 48, that it was sown for the first Crop of *Wheat*, * on the 5th of October, 1765, with *six Stone and three Pounds of Seed*. By the Report 1766, Page 17, it will appear, that it was sown for the second Crop of *Wheat*, on the 18th of October, 1766, with five Stone and two Pounds of Seed; and by the Report of the Year 1767, Page 9, it will appear that it was sown for the third Crop of *Wheat*, on the 18th of October, 1767, with five Stone and two Pounds of Seed.

Respecting the Treatment of the Acre of Land which in this comparative Experiment, was devoted to the Common Husbandry, the Reader will find, by referring to my Report for the Year 1765, Page 49, that it was sown on the 5th of October, 1765, (the same Day on which the Drilled was sown;) but that Half this Acre of Ground, was sown under the Plough, and the

* The Reader who has looked over my former Reports, will recollect, that in the Year 1764, this Ground was under drilled Turneps; in 1765, under drilled Barley, and consequently this first Crop of *Wheat*, was the *third* drilled Crop upon the same Ground.

other

I N T R O D U C T I O N. 7.

other Half under the Harrow, * each half Acre being sown with ten Stone of Seed.

By referring to the Report for the Year 1766, Page 12, and 13, it will appear when these Experiments were reaped, and what was the Produce of each distinctly.

In my Report for the Year 1767, Page 16, it will appear, that for the Crop of Oats, which followed the Wheat upon this Ground, that I ploughed Half of it in October, 1766, in order to ascertain whether once or twice ploughing for Oats be most profitable, in which, I troubled the Society for their Sense and Instructions, for Reasons which will appear in my Report for the Year 1766, Page 16, and 17.

By this Treatment of the Experiment, we have already been informed of the Difference between once and twice ploughing for Oats; and with that Crop closed our comparative Experiment, so far as the Common Husbandry could proceed, in a judicious Practice, without allowing intermission for Fallow; and therefore, when the Oats come off, the Ground was devoted to Fallow; and was accordingly ploughed in October, 1767, for that Purpose.

It now remains for me to inform the Society and the Publick, of the Result of the Continuation of the Experiment on the Acre of Land, devoted to the Drill Culture, and its Produce.

And upon the close of my Report, of this third Crop of Wheat, I shall furnish the Publick, with the Objections which have arisen in the Course of my Practice, to this Species of Culture.

As also, with some presumptive Suppositions, for the Removal of them: presumptive I call them, because

* These two Methods of sowing, were calculated to ascertain whether sowing Wheat under the Plough or Harrow be most advantageous, and the result will appear, by referring to my Report for the Year 1766.

8 INTRODUCTION.

nothing but Time and Experience, can afford accurate Information to Man; which confirms the Importance of making Experiments, for the Inspection and Information of those, who cannot spare Time or Money to make them, for the better Direction of their own Pursuits.

In the Course of this Report, I shall likewise inform the Society and the Publick; not only of the Result of some comparative Experiments in this way, upon a much more extensive Scale; but also, of some comparative Experiments, between different Species of Wheat, sown upon the same Ground.

And I hope such Experiments, upon different Species of Turneps, and their Use to the Farmer, Grazier, or Dairy-man, as will not only shew the Value of that Plant, but which Kind are to be preferred.

EXPERI-

EXPERIMENTS

IN

AGRICULTURE.

Comparative EXPERIMENTS on WHEAT, &c. between the DRILL and COMMON HUSBANDRY.

*The Continuation of a Comparative Experiment,
between the Drill and Common Husbandry.*

AS our Acre of Land, which, in this Experiment, was devoted to the Common Husbandry, produced no Crop in the past Year, I need take no further Notice of it in this Report, than to say, that the next Crop it may produce, has a right I think, to stand charged with the Expence and Rent incurred, in making Fallow of it, and therefore, I shall not charge it in this comparative Experiment, for the past Year.

Hence

10 Continuation of the Comparative Experiment.

Hence, I have nothing to do in this Report, respecting this comparative Experiment, but to furnish my Account of the Acre under Drills, for the past Year.

After this Acre of Ground (the drilled) had produced the Crop of Wheat in the Year 1767, it was sown again with Wheat, on the 18th of October, in that Year, with five Stone and two Pounds of Seed, the Produce of which, is what I am now to give an Account of.

In my former Reports, I have so fully described the Manner, and different Seasons, for performing the several Operations with the Hoe Plough and Cultivators, that I believe it is hardly necessary for me to enter so minutely into the Manner and Seasons of performing them, as I have done heretofore; and therefore I shall in the Gross, take the whole of the Expence of those Operations, at what I have stated them before in my former Reports, when I come presently to state the Account of Profit and Loss upon the Crop.

The Corn, after receiving the usual Culture, stood until the 27th Day of August, when it was reaped, which took three Men a Day, at 14 Pence, consequently the reaping Cost three Shillings and six Pence.

The Produce, was only three Barrels and one Stone of Wheat, and of Straw only 16 Hundred and one Quarter.

Here we see a great Diminution in our Produce, when compared with that of the preceding Year, and by looking at our Produce, in the first Year of Wheat, in this Experiment, we shall find that our Produce has progressively decreased since our first Crop of Wheat; but before I proceed to make any Observations upon a succession of Crops under this Culture, or offer the Objections which have arisen to it, in the Course of my Practice, I shall state the Account of the past Year; and reduce under one general Account, the Crops of the
two

Continuation of the Comparative Experiment. 11

two Methods of Culture, for the Time in which this comparative Experiment has been depending ; that upon the Close, the Publick may perceive, how they stand in point of Profit, when compared with each other.

Dr.

**Dr. One Acre of Wheat in Drills, as the
Expence arose, in the 3d Year.**

					<i>l.</i>	<i>s.</i>	<i>d.</i>
1767.							
<i>Oct.</i> 17.	To ploughing once, after the Crop of 1767.	—	—	—	0	10	4
18.	To Harrowing, with the Drill Har- rows	—	—	—	0	0	4½
	To drilling the seed Corn	—	—	—	0	0	9
	To seed Wheat, 5 Stone, and 2 Pounds, at 25 Shillings <i>per</i> Barrel, so charged, because the Crop of 1767, was valued at that Price				0	5	1½
1767 and 1768.	To the different Horse Hoeing and Cultivating	—	—	—	0	7	7¾
<i>Aug.</i> 27.	To reaping	—	—	—	0	3	6
<i>Sept.</i> 29.	To one Year's Rent	—	—	—	0	18	0
	To trafring 3 Barrels, 1 Stone at 8 <i>d.</i>				0	2	0½
					<hr/>		
					2	7	9¾
	To clear Profit	—	—	—	2	0	8
					<hr/>		
					4	8	5½

Thus the Account stands for the past Year: I shall now State a general Account, of Expence and Profit, between the two Species of Husbandry, for the Time, in which this comparative Experiment has been depending, for the readier Information of the Reader.

*Per Contra.**Cr.*

			<i>l.</i>	<i>s.</i>	<i>d.</i>
1768.					
Aug. 27.	By Produce of Wheat, 3 Barrels,				
	1 Stone at 25 Shillings	— —	3	16	3
	By Straw 16 Hundred, 1 Quarter,				
	at 9d.	— — — —	0	12	2 $\frac{1}{4}$
			<hr/>		
			4	8	5 $\frac{1}{4}$

14 Continuation of the Comparative Experiment.

Dr. One Acre of Land, under drilled Wheat, for 3 Years.

		<i>l.</i>	<i>s.</i>	<i>d.</i>
1766.				
Sept. 29.	To the total Expence of that Year, See the Report for that Year, 1766, Page 20	—	—	3 5 1 $\frac{1}{4}$
1767.				
Sept. 29.	To the total Expence of that Year, See the Report for the Year 1767, Page 12	—	—	2 11 6 $\frac{1}{4}$
1768.				
Sept. 29.	To the total Expence of the Year 1768, See this Report, Page 11	2	7	9 $\frac{1}{4}$
		<hr/>		
		8	4	5 $\frac{1}{4}$
	To clear Profit in 3 Years *	17	4	6 $\frac{1}{4}$
		<hr/>		
		25	8	11 $\frac{1}{4}$

* This Sum amounts to 5 l. 14 s. 10 d. for each Year, which would be a very great Profit to the Farmer, could a Man bring all his Tillage to afford such a Profit, but unless he can first prepare his Land so as to Produce a good Crop of Turneps or Cabbages, he cannot have such Profits by Corn.

*Per Contra.**Gr.*

1766.

	Wheat. <i>B. S. lb.</i>	Straw. <i>T. C. q. lb.</i>	<i>l. s. d.</i>
Sept. 29. By the Produce of Wheat —	7 11 5	1 19 1 22	
See the Re- port of 1766. Page 12 —			12 16 7

1767.

Sept. 29. By the Produce of Wheat —	5 12 7	1 9 2 27	
See the Re- port for 1767. Page 13 —			8 2 11 $\frac{1}{4}$

1768.

Sept. 19. By the Produce of Wheat —	3 1 0	0 16 1 0	
See this Re- port, P. 12 -			4 8 5 $\frac{1}{4}$
	<hr/> 16 4 12	<hr/> 4 5 1 21	<hr/> 25 8 11 $\frac{1}{2}$

'The Acre of Land, devoted to the Common Husbandry in this comparative Experiment, having been under Fallow during the past Year, consequently produced no Crop, and therefore I shall State the Expence and Profits of the two first Years, in Order to compare the Profits of the two Methods of Culture.

Dr. One Acre of Land, under the Common Husbandry.

1766.			
Sept. 29.	To the total Expence upon the Crop, in the Year 1766, See the Report of that Year, Page 22	— — — —	l. s. d. 4 1 8
1767.			
Sept. 29.	To the total Expence upon the Crop, in the Year 1767, See the Report of that Year, Page * 20		3 7 1½
1768.	To Rent and Expence for Fallow left upon the next Crop	— — —	0 0 0
			<hr/>
			7 8 9½
	To clear Profit in 3 Years	—	16 1 9
			<hr/>
			23 10 6½

* The Account stated in the Report 1767, is only for Half an Acre, this Account is for an Acre, as it must be doubled, as I have done.

For three Years. *Per Contra.* *Cr.*

1766.

Sept. 29. By Produce of Wheat, 10 Barrels,
18 Stone, 2 Pounds, Straw, 2
Tun, 6 Hundred, 1 Quarter, 2
Pounds. See the Report for
1766, Page 23 † — — 18 2 10

1767.

Sept. 29. By Produce of Oats, 13 Barrels,
5 Stone, and Straw, 1 Tun,
1 Hundred, 3 Quarters, 20
Pounds. See the Report 1767,
Page 21 † — — — 5 7 8½

1768. Under Fallow — — —

23 10 6½

0 0 0

23 10 6½

† I have taken for this Credit, the Crop produced under the Plough, as being the greatest Quantity.

‡ I have taken for this Credit, the Crop produced from once plowing.

18 Continuation of the Comparative Experiment.

From the two preceding Accounts, I shall now state the Comparative one for three Years, in the advantageous Manner, which has always during the Course of this Comparative Experiment, been given to the common Husbandry, and then examine the Comparison, in another Manner.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
The clear Profit arising from the Drill Culture, in three Years, appears to be	17	4	6 $\frac{1}{4}$
The clear Profit arising from the common Husbandry for the same time, appears to be	—	—	—
	16	1	9
Superior Profit in favour of the Drill Culture	—	—	—
	1	2	9 $\frac{1}{4}$

Thus we see, that in actual Practice, regard being had to the many Observations made, in the course of this Comparative Experiment for three Years; that the Drill Culture, has afforded a superior Profit of only 1*l.* 2*s.* 9 $\frac{1}{4}$ *d.* in the Manner which the Account has been carried on. I own that in the Commencement of this Comparative Experiment, I had Expectations, that at the end of three Years, the Profit, even in the Manner I have stated the Account, would have been much greater in favour of the Drill Husbandry, than we now find it to be. However, the Method which was first adopted in stating the Account, could not be departed from, because that would have had the Complexion of Partiality; and as I had much rather have the character of Candour than Ingenuity, I have on the other Side, given the Answer to this important Question to the World, as I have found it in the Event.

And although that Event turns out to be such, as will not be sufficiently inviting to every Tiller of Land to adopt the Drill Culture for Corn; yet, the great Advantage with which the common Husbandry appears, in the Course of this comparative Experiment, I think must so far shew the Aid which the Drill Husbandry may be of to the common, by universally adopting it in the Preparation for Corn, by first sowing Turneps in

Continuation of the Comparative Experiment. 19

in Drills; since, in the original Preparation of the Ground upon which this comparative Experiment has been carried on, the Reader will recollect, that Turneps in Drills, was the first Crop *, and I have so frequently urged the sowing them in that way, as the most effectual Method of preparing Land for any other Purpose whatsoever, that I need not enlarge upon that practice; particularly, as I shall have Occasion to say something upon that Subject, in the Course of this Report.

I shall not further recapitulate the many Advantages which have been given to the common Husbandry, in the Course of this comparative Experiment, but refer those who look over the Account of my Labours, really for Information, to the occasional Observations in my former Reports; and therefore I shall now proceed to make some general ones, for the Information of the Reader.

General Observations, upon this Comparative Experiment.

I. Observation.

Upon the original Commencement of this comparative Experiment, it may be remembered, that the Land for both Methods of Culture, had been two Seasons under Drilled Crops, (namely, Turnips and Barley.)

II. Observation.

Ever since, the Experiment has gone on regularly, and in three Years, we have seen, that the Acre devoted to the Drill Culture, has produced 16 Barrels, 4 Stone, and 12 pounds of Wheat; and of Straw, 4 Tuns, 5 Hundred, 1 Quarter, and 21 pounds.

* Which will appear by referring to my Report for the Year 1764.

B 2

III. Obser-

20 Continuation of the Comparative Experiment.

III. *Observation.*

The common Husbandry has produced during that Time, of Wheat, 10 Barrels, 14 Stone, 4 Pounds*, of Oats, 14 Barrels, 6 Stone, 7 Poundst, and of Straw of both kinds, 3 Tuns, 10 Hundred, 3 Quarters, and 23 Pounds.

IV. *Observation.*

In this View of the Comparison, we perceive the Drill Husbandry has the Advantage also, tho' not equal to what I flattered myself with, neither does that Superiority, come up to my presumptive Calculations.

V. *Observation.*

Now let us examine the Matter, in another Point of View, and we shall find the Drill Culture, to have the Advantage, in a greater Degree, than appears upon the face of our comparative Account — For suppose we value the Crops of Wheat, produced from each Method of Culture, at the Medium Price of Wheat for three Years past; in that Case, the Quantity produced by the Drill, the Price being a Penny a Pound, will amount, with the Straw, at 9d. an Hundred, to 22*l.* 13*s.* 1*d.* out of which, we are to dedu& the Expence, Page 15, 8*l.* 4*s.* 5*d.* and then the Profit will appear to be only 14*l.* 8*s.* 7³/₄*d.* the Produce of Wheat from the common Husbandry being valued at the same Price, the Oats at six Shillings, and the Straw at 9d. an Hundred, will amount to 19*l.* 10*s.* 1*d.* out of which we are to dedu& the Expence, which will leave the clear Profit, 12*l.* 1*s.* 3¹/₄*d.* this Sum being compared with the above Profit arising from the Drill Method, shews the latter hath the Superiority by 2*l.* 7*s.* 3³/₄*d.* This is very near sixteen Shillings per Annum, for the Acre of

* In this Amount, I include the Produce under the Plow and Harrow, as appears in the Report of 1766.

† In this Amount, I take the compleat Produce arising upon the Acre, from both the Methods of Culture used.

Land,

Land, over and above the Profits of the common Husbandry, well executed, as the Crops certainly prove : An advantage, which without any other, is certainly inviting, because, now we proceed not upon Supposition, but by Experiments, which have been regularly carried on, and which have been seen by thousands of People.

VI. Observation.

Altho' the superior Profit, which I have just shewn may be Inviting, yet the Crop of the past Year, has been so much less, than what we might reasonably have expected, that I own it seems improbable that a succession of Crops of Corn, upon the same Ground, for a long series of Years, can be so profitable, as it might be, by mixing the two Species of Husbandry, in the Manner I shall describe hereafter.

VII. Observation.

Much might be charged, respecting the Diminution of our Crop, to the Severity of the Season, but the whole cannot, as I shall now proceed to shew.

Further Observations, by way of Objections, to a long Succession of Crops of Corn, under the Drill Culture, founded upon my own Experience, in the Course of which, some Objection will appear to the Manner in which I have practised it. Upon the Alteration of that I shall suspend my Judgment, of the Merit or Demerit of this Husbandry, under a long Succession of Crops of Corn.

I expect when the prejudiced Reader comes to this Page, he will exult at his own Sagacity, that he should have foretold, that the Drill Husbandry "will never answer," for that in general is the decisive Argument of the inexperience

22 Continuation of the Comparative Experiment.

inexperienced. But that is what my practical Experience will not yet allow me to say, and I believe never will, because I am assured, for some Articles in the Farmers Department, it is preferable to the common. And by such Readers, I shall be allowed to say, that I have not found the hacknied Objections, which I have so frequently heard of, to happen in the Course of my Practice, except that, which from want of Care in the late sowing, arises from the Havock which Birds will make upon the Corn, when coming up: this Objection I own, I have found valid. But Impracticability, the Corn lodging, and all those common-place Objections, I have found to have been the mere Inventions of Imagination, and not to have arisen from Experience. Sorry I am, that I can offer Objections, of a more solid Nature.

That the Corn will not lodge, I do not assert; mine has lodged by strong Winds, and heavy Rains; but in two or three dry Days, it will be erect again, even where the Corn is strong and heavy. A Circumstance, which seldom happens to Wheat when sown in the common way, for when that is down, it seldom rises again, though I have sometimes seen even that rise.

The Objections which I have Experienced, are as follows.

In my former Papers, and frequently in Conversation, I have mentioned, that the Reason why the Drill Corn does not ripen quite so soon as that sown in the common Way, is, that the Corn is fed a longer Time than it can in the common Way, because the Roots have so much Room to extend themselves in search of Food, and that the Roots are aided in that Work, by the Culture of the Intervals.

Hence, I find arises my first Objection, to the Drill Culture for Wheat, in a wet Season, or on poor, or cold Grounds*.

I Ob-

* Lands are cold from various Causes: but contrary to the received Opinion, that Land lying upon Quarries, and particularly

I. *Objection.*

The Formation of the Grain is not early enough, from the Coldness of a wet Season on poor or impoverished Grounds, particularly in a Country, where the Harvest is generally late, for want of a warmer Sun, than we have in Ireland, and therefore the long Nights come on, which are damp, even if Rain does not fall; and if the Sun happens to be clouded, the Corn remains wet all the succeeding Day, particularly, if it be strong and thick.

For want of Warmth, Vegetation ceases, and the Grain remains shrivelled, and in a State of Poverty; and when threshed, is what the Bakers call a flinty Grain, which yields less Flour than a full Grain. This Effect indeed, is not peculiar to the Drill Culture, because it will also attend Wheat, when sown in the common Way in a greater Degree; if the Corn be strong, as is generally the Case in a wet Season. And wet Seasons are Productive of Smut †, Blight ‡, and Rust §, as has appeared,

particularly Lime-stone Quarries, is from thence, warmer, than other Soils; I find it quite otherwise, and a Moment's Reflection, I think, will convince every reasonable Man thereof; for upon examining the Matter, we find a Lime-stone to be a tolerable good Barometer. Upon the Approach of wet Weather, the Lime-stone always acquires a Dampness, similar to that of Salt or Rock Salt, when Stones which are not capable of making Lime, will remain dry. In wet Weather, Lime-stone attracts great Moisture, and will be intensely cold; this cannot be wholesome to Plants or Vegetation, in wet cold Weather; particularly at a Season, when the Crops of the Earth require dry warm Weather.

† Smut is a Disease, which all our white Corns are liable to; the Ears of Corn are abortive, containing, instead of Flour, in the Skin of the Grain, a black Powder, like Ivory or Lamp-black, the Skin of the Grain is filled with this Powder. The Farmer distinguishes these abortive Grains (if I may so call them) from sound Grains, by the Name of *Balls*.

‡ Blight is quite another Disease, though the Farmer frequently calls Smut by this Name. But Blight produces abortive Ears of Corn, without any Smut. It is not so common as Smut,

24 Continuation of the Comparative Experiment.

peared, in the Course of my Experiments and Observations, but I shall have Occasion to take Notice of that in another Place, and therefore dismiss it for the present.

II. *Objection.*

I find, when four or five Crops have been taken off the Ground, that the Part of the Ridges upon which the Corn stands, (particularly, where the Land in its *own Nature*, be poor,) throws up such a Quantity of offensive Weeds, Poppies, Hog Fennel, &c. particularly in a wet Season, that no Labour can eradicate them, but Fallow and Turneps. Horse Hoeing the Intervals, seems to give them Vigour; and if the Corn be strong, so that the Hoe Plough cannot operate, after June, the like Weeds, rise wonderfully in the Intervals. Perhaps upon Land, naturally rich, this Effect might not happen; at least, before a greater Number of Crops have been taken off.

III. *Objection.*

To the preceeding Objection, it may not be improperly placed, for me here to observe, by way of a third Objection, that in the Course of my Practice, I have made my Ridges only five Feet broad. I expect, if they were made six Feet broad, that from there being more Room to cultivate between the Rows of Corn, the Instruments might be introduced more frequently, and thereby greatly contribute to the Destruction of the Weeds; for it has been after the Culture has been finished, that they have shot up, and formed their Seed, which I conceive to be productive of them in the succeeding Year.

Smut, neither is it so injurious, because by that, we only lose the Profit which the Ears might have produced, whereas Smut discolours the sound Grain, in threshing, and renders it unfit for Market.

|| Rust is a distinct Disease, from the other two Kinds, and is what the Farmers in general call Mildew. See my Report for the Year 1764, P. 59.

IV. *Ob-*

IV. *Objection.*

My fourth Objection to a long Succession of Crops of Corn, arises in another Circumstance, though probably it is produced from the same Cause: namely, that, of the Ridges having been too narrow.

The Crop which I have already given an Account of, in Page 9, 10, and 11, we have seen was a very poor one, and the Appearance it made from Christmas 1767, to the Harvest of 1768, disturbed me much. I knew a sufficient Quantity of Seed had been allowed, and yet after Christmas, the Corn appeared to be very thin. For some Time I was totally at a Loss, how to account for this Appearance, but upon opening the Ground in some few Places with a little cautious Care, the Cause manifestly appeared.

For I found, that the Stubble of the preceding Crop, which interfered with the Coulters of the Drill Plough in its Passage, when sowing the Seed for the 3d Crop of Wheat, caused the Ground to remain hollow in many Places about the Seed sown; and although the Corn might come up ever so well in Appearance, yet when the Winter Rains come on, these Hollows are so many Lodgments for Water; which presently perish the Plants. Hence arises a great Diminution of our Crop.

Six feet Ridges may probably remove this Objection also, because in ploughing the Ground for a succeeding Crop, the Stubble of the preceding one will not be so apt to approach the middle of the new made Ridge, as when the Culture is carried on with narrower Ridges.

V. *Objection.*

And lastly, I shall observe, that it seems to have been the Opinion of many Writers, who have wrote upon this Husbandry, that the constant Production of Crops, without Intermision, does not impoverish the Ground; but that, on the contrary, the Culture of the Intervals improves

26 Continuation of the Comparative Experiment.

improves it. This would be a very inviting Consideration indeed, did practical Experience confirm it *. But I find this not to be the Case, for certain it is, that the capability of the Ground to feed Plants, is every Year less, after it has produced a Crop of Turneps; which the Reader will please to recollect, was my Original Preparation; is that which I formerly recommended, and do still recommend.

Animadversions upon some of the foregoing Observations and Objections, interspersed with Directions, for mixing the Drill and Common Husbandry; by which it is apprehended larger Profits may be made, than by adhering to either distinctly, by way of Conclusion, upon the Close of this comparative Experiment, between the two Species of Culture.

In my 4th Observation, the Advantage arising from the Drill Husbandry is “not equal to what I flattered myself with; neither does that Superiority come up to “my presumptive Calculations.”

I shall hope that the candid will not condemn me on that Account, since it is impossible that human Foresight can pronounce, what can or will be the Effect of Operations upon the Earth, or what will be the Produce; and therefore it is, that Experiments are attempted, accurately to inform Mankind, that they may thereby be taught to proceed with the greater Safety.

My 5th Observation remarks upon the Diminution of our Crop in the past Year, and concludes with obser-

* I own, before my Repetition of Crops, upon the same Ground, I was very willing to believe this, because the Reasoning which has been made use of, strikes the attentive Reader with great Force.

ving,

ving, "that it seems improbable, that a Succession of
"Crops of Corn, upon the same Ground, for a long
"Series of Years, can be so profitable, as it might by
"mixing the two Species of Husbandry."

Hence, some Readers may conceive a total Condemnation of the Drill Culture to be my Sentiments; but I mean not to be so understood by any Means; for it will at least afford *two* material Benefits to the Culture and Increase of Wheat, as I shall shew presently.

As to my first *Objection*, though it stands very strongly against the Drill Culture upon *poor* Ground, yet it is no less strong against the Common upon the like Land. Or in the like Seasons.

In my 2d *Objection*, I have said, "that no Labour can eradicate the Weeds, but Fallow and Turneps." I shall hardly be understood, to mean, that it is impossible to remove the Weeds, but what I mean is, that no Expence, which the Farmer should embark in will do it; for if the Expence in any Case, be greater than the Profit, the Consequence must be injurious to him.

In the Course of my Experiments I have therefore, always endeavoured to confine myself to such Expence, as the Subject would admit of; where more has been required, I consider the Attempt abortive, or at least unprofitable.

The Reader will recollect, that in this my second *Objection*, these Weeds have been troublesome in the continued *Succession* of Crops, but in the first Crop of Wheat, there were very few Weeds, and that was our third Crop*.

My 4th *Objection* I fear will remain valid, under a long Succession of Crops, on five feet Ridges: whether their being made six feet wide will remove the *Objections*. Time only can shew.

* First Turneps, then Barley, then Wheat.

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I am aware, that it may be urged, that the Stubble may be removed, which I admit, but altho' that may be done to Advantage, in a small Quantity of Ground, yet it would be a tedious and expensive Business to clear a large Quantity; besides which, it would be robbing the Ground of so much Manure as the Stubble would make.

My 5th *Objection* I am afraid will be found incontestibly true in Practice, with five feet Ridges, how far those of six Feet may remove, I shall wait, until my Experience shall inform me.

The Causes of the Diminution in our Crop of the past Year, I have already shewn, under the 7th Observation, and the Head of Objections.

We have seen, that our first Crop of drilled Wheat was a good one, and our second, tho' not so good, was yet not a contemptible Crop.

After the first Crop, the Ground was left in a good State, as I have mentioned in my Report for the Year 1766. And therefore, I am very inclinable to believe, that if the Cultivator sows his drilled Corn, upon Ridges five feet broad, that it will be most profitable to sow his second Crop of Wheat, under the Harrow, after once or twice ploughing the Ground, in the ordinary Course of Business. For this Purpose the Ground will be in fine Condition, particularly if the first Crop has been Turneps, by way of Preparation.

This Crop of Wheat may be followed by Spring Corn, in which, after it is up, Clover should be Sown. This I recommend to be pastured for three Summers *. At the End of the third Summer, I should wish a Month's Growth of the Clover to be left standing, and in September

* If the Cultivator observes any Docks rising in his Clover, in the Spring of either of those Summers, let him have them carefully taken up by the Roots and burned, or otherwise effectually destroyed.

Continuation of the Comparative Experiment. 29

tember plough up the Clover Lay†, in broad Ridges, and sow Wheat under the Harrow‡. That may be succeeded with spring Corn: and then Fallow for drilled Wheat, or rather Turneps §, which is to be followed by the same succession of Crops.

Hence we see, that the drill Culture in the setting out, at least admits of two Crops of Wheat in Succession, which will be good ones, provided the Seasons be favorable for that Corn.

A Crop of Spring Corn, three Crops of Clover, a Crop of Wheat, and a Crop of Spring Corn after it.

So that from one Preparation of the Ground, in this Course of Tillage, we might have three Crops of Wheat, three of Spring Corn, three of Clover, and one of Turneps, three of which Crops will be in the Drill way.

Thus ten Years will be consumed, which affords ten profitable Crops, whereas in the common course of Tillage, only six Crops can be obtained in nine Years, every third Year being consumed in Fallow, abstracted from the great Expence which attends the labouring Fallow.

Another Advantage will arise in the superior Quality of the drilled Corn, in the first Crop for Seed, which will always be better and cleaner Corn, than the common Husbandry can afford upon the same Ground in the same Season, particularly if the first Preparation of the Ground shall have been for Turneps.

I am not unmindful that it may be objected; that it will be impossible to find Manure to prepare the Ground in the setting out, for Turneps, in the Manner
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† This Growth of Clover will not be a bad Substitute for dressing the Ground with Manure.

‡ I have seldom had or seen better crops of Wheat by Fallow, than I have had and seen in England from this Method.

§ For this Purpose, the Land is to be manured properly.

30 Continuation of the Comparative Experiment.

I recommend ; I admit, if no more Attention can be excited in the Farmer to the making Manure, than is now generally given, it will not be much Ground that he can Manure ; but if he will attend to the Methods of accumulating of it, in the Manner hereafter recommended, he will be enabled to cover a great Quantity of Ground ; and if he will consider, that ten Acres of Land, thus improved, will produce him more Corn than twenty Acres can in his present Practice, and consequently, that the Labor is less by half ; surely he will perceive that his Profits must be greater *.

But where it may happen, that the Course of Tillage which a Man may be in, in Point of Quantity of Ground, shall, in the Commencement of the System or Course of Tillage, which I now offer to his Consideration, be more than he can prepare for Turneps, as in all Probability it may ; in that Case, he can, after well Manufacturing his Fallow, commence this Scheme of Tillage, by first drilling his Wheat, and then proceed with the other Crops, as I have already mentioned.

But where the Cultivator may not choose to have his first Crop in the Drill way, he may proceed with the like Succession of Crops, after fallowing the Land for the first Crop of Wheat, and if possible manure it also. But in this Case, he must remain satisfied with one Crop of Wheat in the Beginning, instead of two.

Either the Drill and common Husbandry thus united, or even the common alone, I wish to see introduced amongst the Farmers of Ireland; because they will thereby have greater Productions of Corn, with much less Labour and Expence, than they can have from their present Practice.

And

* Besides, Manures abound so much, in almost every Part of Ireland, that few Occupiers of Land, need to be at a loss, for there are few Farms circumstanced as mine is in that respect, for I have no kind, but what I can acquire by Care and Attention.

And for their satisfactory Information and Inspection, I shall prepare for a Set of Experiments, in the following Manner, if it shall be the Pleasure of the Society, that I should do so.

The two Acres of Ground, which has been now for five Years, under the Comparative Experiments already related with the Remainder of the Field, which has also been under Experiments, I have now thrown under Winter Fallow. I intend it for the Purpose of Turneps, Cabbages, and Turnep Cabbages, in order for Experiments, at the same Time, that I shall be preparing it for the mixed Husbandry, which I have just proposed.

After these, I shall drill it with Barley, and then divide it into distinct Quantities, and begin with sowing Wheat in Drills, Wheat in the common way, and so carry on a Set of Experiments entirely under the common Husbandry, and another Set by mixing the Drill and common Husbandry, and so proceed with the whole Process, in each Method comparatively, furnishing Annually an accurate Account of Profit and Loss.

And as these Comparative Experiments proceed, others will come on in Succession, in a more extensive way, so that I soon promise myself the Pleasure of having such a Chain of Experiments, as to be able to exhibit to the Inspection of the Publick, Variety of Things in the same Season.

And in my further Practice of the drill Culture alone, I intend to introduce five and six feet Ridges, in Opposition to each other, by which, in a Succession of Crops, we shall be informed, whether the Obstruction by the Stubble, as mentioned in my fourth Objection, to a long Succession of Crops will remain valid.

Comparative

Comparative Experiments, in the Culture of Wheat, between the Drill and common Husbandry, upon a much larger Scale, than the preceding Experiments.

My former Comparative Experiments on Wheat, have been but small, in Comparison of those which I am now to give an Account of ; and therefore it might be imagined, that to extend the drill Culture, upon a large Scale would be impracticable.

At least to remove such Apprehension, I considered it as incumbent upon me, to undertake a more extensive Culture by way of Experiment ; because the exhibiting large Fields of any particular Species of Husbandry or Plant, will be much more satisfactory and informing to the Publick, than smaller Experiments can possibly be ; and as mine upon Wheat in the past Year, have been in a large way : I did therefore invite all Degrees of Men, by publick Advertisement, to view and examine them ; and indeed the Number who resorted to my Farm, in Consequence thereof, during the past Summer, was not a little pleasing to me ; particularly from the Approbation which Gentlemen expressed, and the Admiration of the Vulgar.

I am now to give some Account of this Set of Experiments ; the Soil, the Preparation that it received, the Kind of Wheat it was sown with, the Treatment of the Part under the Drilled Corn, and the Produce from each Method of Culture ; interspersed with Observations upon the Species of Corn, the Season, and its Consequences.

This Field, contains twenty Plantation Acres, which in October 1766, I broke for Fallow, after it had produced a Crop of Oats, and without particularizing the Time in which it received the different Ploughings, it will be sufficient for me to say, that in the Preparation of the Fallow, the whole Field was ploughed five Times,
and

and harrowed accordingly ; infomuch, that when it came to be sown, it was really a well manufactur'd Fallow.

The Field has been constantly in a course of Tillage, as long as the oldest Workman in the Neighbourhood can remember ; I myself have now had it under a common course of Tillage for six Years, during which Time it has had no Manure, neither can I discover any Man in the Neighbourhood, who can remember its ever having any : nor did I use any kind of Manure to any part of the Ground, upon my devoting this Field to the service of the Publick.

The Soil is shallow, inclineable to a stiff hazle coloured Loam, with Abundance of small flattish Lime-Stones in it, and lies upon a Lime-Stone Quarry, which in general is pretty near the Surface.

Ten Plantation Acres of this Field, I devoted to the common Husbandry, and the remaining ten Acres to the drill culture, in order to exhibit to the inspection of the Publick, an extensive comparative Experiment in that way.

Well knowing the uncertainty of the Weather for sowing Wheat in Ireland, by woeful Experience, I prepared to sow this whole Field pretty early, and the two Methods, as much together as might be.

For on the 26th. of September 1767, I began to sow the ten Acres in the common way, and finished on the 1st. of October.

The ten Acres devoted to the drill Husbandry, was Sown on the 28, 29, and 30th. of September*.

* It may not be improper to inform the Reader, that this was sown by a Man who had never held the drill Plough before ; namely my Clerk, who tendered his Service, as my principal Ploughman was lame : I was willing to gratify the young Man, and he executed his undertaking very Completely, after going over two or three Ridges.

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The ten Acres under the common Husbandry, was allowed ten Barrels of Seed, and that under the Drill, took 53 Stone, which is two Barrels 13 Stone.

The Species of Wheat, with which I sowed this 20 Acres of Land, was the *Blue Cone*, commonly known in Ireland, by the name of Turkey Wheat.

I shall have occasion, to say something hereafter, respecting this particular kind of Corn, and therefore, in this place, it will not be necessary for me to say more.

The Corn in both the Experiments came up very well, and made a very fine Appearance all the Winter.

The ten Acres of drilled Corn, received the usual Hoings and Cultivations, at the proper Seasons, in the manner described in my former Reports.

From the Spring, to the latter end of June, this whole Field of Corn, made as promising an appearance, as ever I saw in any Field in my Life; and the many Gentlemen and Farmers who came to see it agreed in the same Sentiments; for the Corn was strong, thick and healthy; and in its Complexion, gave as strong a Testimony of what may be done by the power of good Tillage, as could be seen, in so much, that the Crop at this Time, was valued at a great Sum of Money.

But the whole Field met with a Fatality, which no human Power could guard against; for on the 25th. of June we had immoderate Rain, and from that time, to the beginning of August, there were few dry Days, and scarce any which were not cloudy and hazy, attended with frequent Storms of Cold Wind.

This prevented the Corn ripening kindly, and brought upon it an infinite deal of Smut, in so much, that the Corn is scarcely saleable at a low Price.

What

What contributed not a little to this Disease, I do conceive was, that from the long continued Rain, cold Winds and insufficient Sunshine, the Corn was scarcely ever dry, from the 25th. of June, to the Approach of Harvest.

And I cannot, but be very inclinable to attribute the injury of the Smut, to a Disposition in this particular Corn to attend that Disease, on account of the extraordinary largeness of the Ears, for thereby it retains the Moisture, which I believe is productive of the Disease.

And what seems to corroborate this Apprehension is, that amongst the Seed, there happened to be a few Grains of red and white Wheat, * which grew amongst the Cone; and although both these kinds were greatly injured in point of Quality, yet I could find very few Ears which were smutted.

Hence I think, the cone Wheat is more liable to this Disease, than either of the other kinds, and what I shall have to say hereafter, when I come to speak of another set of Experiments in another Field, will seem to confirm it.

The ten Acres under the common Husbandry, was began to be reaped on the 15th. of August, and was finished on the 18th. And the ten Acres under Drills was reaped on the 20th, 22d, and 23d.

From the great bulk of Corn and Straw, which these Experiments afforded, I was under an indispensable Necessity, of Stacking both the Experiments in the Field, according to the Custom of the Country, as I had not Barns to take them into; and after that I was obliged to make Ricks of them in my Haggard.

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* From the circumstance of my having at the time of Trashing the Seed, only one Barn, which renders it very difficult to have Seed free from Mixture, but that will I hope, not happen again, as I have built another large Barn.

The ten Acres under the common Husbandry, afforded ten large Field Stacks, and the ten Acres under the Drilled, afforded twelve large Field Stacks.

But still, upon the Corn being Ricked in the Haggard, a more accurate method was taken, for the Sheaves, were counted, and the common Husbandry afforded 512 Barts, 7 Sheaves, and the Drilled 503 Barts, 4 Sheaves*.

When the Corn of these two Experiments came to be threshed, the drilled afforded 41 Barrels. 17 Stone, 7 pounds of Wheat, and the common Husbandry 40 Barrels, 12 Stone, and 6 Pounds.

Not half the Crop which was expected, for before the wet Weather came on, it was imagined this Field would have produced near 200 Barrels of Wheat; such was the promising Appearance it made.

But in order to form some kind of Judgment, of what might have been expected, I undertook to separate the smutted Ears of a Sheaf, from the sounder Ears, and of the smutted or abortive Ears, there were 215, which contained nothing but the black Powder of Smut; and and of the sounder Ears 524; so that we see by this Misfortune, two fifths of our Ears of Corn were destroyed.

But there is yet another great diminution of our Crop, even in what remained sound; for of this Corn, it takes 753 Grains to weigh an Ounce, Averdupoise; whereas, if the Season had been favourable, I do not believe it would have taken near 600 Grains to weigh an Ounce, because the Grains of the cone Wheat are remarkably large, when they fill properly.

But suppose the Grain had filled, and even 600 Grains had been required to weigh an Ounce; in that case we have lost upon our produce of Corn, three fifteenths.

Now

* A Bart, is 20 Sheaves.

Now if we add to the actual Produce which we obtained, two fifths for the smutty Ears, that would augment our Produce upon the ten Acres of drilled Corn, to 58 Barrels, 12 Stone, 7 pounds; and when we add to that, three fifteenths for the insufficient quality of the Grain, amounting to 11 Barrels, 14 Stone, and 7 pounds; in that case, our Produce upon the ten drilled Acres, would have been 70 Barrels, and 7 Stone; and in a greater proportion I apprehend, would have been that of the common Husbandry: but from the extraordinary Stoutness of this Crop, it suffered more by the Severity of the Season already mentioned, than the drilled Corn, and therefore I conceive was something less than the drilled; and not, I really believe, that the drill Husbandry will produce most, where the Ground shall be equally prepared, for I think my former Experiments, have shewn the contrary.

Many were my Motives, for sowing this particular species of Wheat in these large comparative Experiments. When the Crop succeeds, it will produce more than any other Wheat that I know of, for the Ears are larger, as are the Grains, they stand in the Ear much closer together than any other Corn, and contain a greater Number, insomuch, that it is no uncommon thing, for an Ear to contain an hundred Grains, I have had them to produce 126, from an Ear.

The Corn having Beards upon it, like Bere or Barley, is some Defence against Sparrows lodging upon it, for when they pitch upon the Corn, whilst the Ears are erect the Beards prick them in the Breast, and cause them to go off again: however, I would not be understood to mean, that this is a total Defence, for when the Ears ripen, they decline, when I have stood and seen the Sparrows commodiously lodge themselves upon the heel of the Ear, thereby avoiding the Points of the Beards, (as a Man would the Point of a Sword) thus situated, they first proceed to pull off the Beards, and then devour the Grain. So sagacious, are those Enemies of the Farmer.

Altho'

Altho' the Circumstances already mentioned, are inviting, to the Culture of this particular Species of Wheat ; yet I have now experienced some Objections to it, which I think more than counter-Balance those promising Advantages.

We have found, that it will not ripen kindly in a Wet Season, if it be thick and strong ; and that, in those Cases, it is susceptible, of contracting the Disease of Smut ; which not only greatly diminishes the Crop, but discolours the sound Corn.

True it is, these are Objections that are governed much, by the good or bad Season, and therefore, in some Measure, are accidental ; hence this Species of Corn should not be wholly rejected on that Account.

But there seems to be yet another capital Objection to it ; namely, that it does not afford so much Flour, as either the red or white Wheat ; but from the general Poorness of every Kind of Wheat from the Crops of the past Year, I could not examine this particular with that Accuracy, which I intended ; because I think the different Species of Corn for such an Enquiry, should be grown upon the same Ground, in alternate Rows, and should undergo this Examination for the Information of the Publick, when the Grain of each Kind is perfect and good.

However, upon the Whole, this Experiment informs the Publick, that this particular Species of Wheat is more susceptible of Injury, in cold wet Seasons, than either the Red or White Wheat ; for I have lost by the Experiment, at least 50 Pounds more than I should have done, had I sown either of those Kinds ; but hence it is not to be understood, that I conceive, either of them would have produced a full Crop, because I could have no Reason to expect it in such a Season ; for in another Part of my Farm, I had a Field of four Acres, sown under the Common Husbandry, with Red Wheat, and Pains was taken in Manufacturing the Fallow (the Ground

Ground is very poor) and I had only nine Barrels of Merchantable Corn, but what I had was good *, and sold in the Market for 23 Shillings a Barrel; whereas, for the Cone Wheat, I got but 17 Shillings. Six Shillings a Barrel in the Price, is a vast Difference.

From these Circumstances, I believe I shall hardly venture to sow the Cone Wheat again, in any other Way, than so far as the Information of the Publick is concerned, in comparative Experiments, upon the same Ground.

*Some Account of Comparative Experiments,
between different Species of Wheat, sown
in alternate Rows, upon the same Ground.*

It seems to be a Matter worthy of some Admiration, that Mankind are not yet fully apprised, which kind of Wheat, amongst the many Species we have of that Grain, is most worthy of the Farmer's Attention.

From the Inattention which I have observed in England to this particular, as well as in Ireland, it may not have been unnatural for a Man to take it for granted, that the Difference has been so trifling, that Farmers have not considered it as a point, worthy of any material Care.

In England I have much oftner seen mixed Fields of Wheat than I have of particular Species by themselves; in Ireland, indeed, not so frequent; not I fear, because the Farmers are more careful and better informed as to that Point, but probably because fewer Acres are sown than in England; and consequently the Sight of the Traveller is not so frequently caught, by that rich cloathing of a Country, Fields under Corn.

Reflecting upon this Circumstance, in the Summer of 1767, as I had often, seriously before, I began to consider it an Enquiry fully within my Department; and upon consulting some Gentlemen upon it, whose Zeal
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* It is remarkable, but I have always found, that poor ground produces Wheat better in Quality than rich Ground, particularly in wet seasons, but it is always insufficient in quantity in every Season, to afford profit to the farmer.

in the Cause of, and Judgment in Agriculture, does Honour to themselves, and Service to their Country, and they were of the like Opinion; and therefore I was determined to introduce a set of Experiments in that way, for the Information of the Public, as far as the different Species of Wheat I had would admit of.

For this Purpose, I fixed upon a Part of the Field mentioned in my Report for the Year 1764, Page 6 &c. and 39, which has been under drilled Crops ever since, without any Addition of Manure, since that Time. But preparatory to this set of Experiments I made Fallow of the Land.

According to the Method, which I have hitherto practised, I threw the Ground into Ridges of five Feet breadth for drilling.

Of those Ridges, the Ground afforded 72, and each Ridges was $33\frac{1}{2}$ Perch long, or $672\frac{1}{2}$ Feet.

On the 3d of September, 1767, I began on one side of the Ground to sow with the Drill Plough, Blue Cone Wheat, and sowed with that Kind of Corn, every *third* Ridge through the Field, by which the Reader will perceive, that by this Method, although we began on one Side, yet we finished with this Species of Corn on the other, and that consequently, one third of the Ground was sown with this Species of Wheat, amounting to 24 of our Ridges.

On the 4th of September, 1767, I began, as the Day before, with the next adjoining Ridge to the first, and sowed that and every third Ridge with red Wheat.

On the 5th of September, 1767, I began in like Manner, and sowed the white Wheat.

Thus three different Kinds of Corn, stood in alternate Rows through the Field; my Intention in which was, that each Species of Corn, should have an equal Chance of Ground in Point of Quality: a Circumstance which renders this Method of Experiment, one of the
Fairest

Fairest and most Accurate, perhaps, that an enquiring Man, can possibly make ; not that I conceive, that any thing less, than a Series of Experiments in this way, can accurately inform us of the Truth, with Respect to what Kind of Corn is to be preferred.

In this first Essay upon this Enquiry, the Reader will perceive, that of each Kind of Corn, there were 24 Ridges in the Field, each Ridge, $67\frac{1}{2}$ Feet long, and 5 Feet broad.

If we multiply our Length by the Breadth, the Number of Square Feet in each Ridge, will appear to be $3362\frac{1}{2}$, which being multiplied by 24, that being our Number of Ridges under each Kind of Corn, our Answer will be 80700. That will be the Number of Feet, in each of our Parcels, of 24 Ridges.

441 Feet, being the Number in a Perch of Ground, that Number is to be our Divisor of 80700, which will shew, that each Parcel of 24 Ridges, contained 183 Perch, (wanting 7 Feet,) Plantation Measure ; which is one Acre, and 23 Perches, under each Kind of Corn.

This Field was regularly Horse-hoed, as I have described in my former Reports, and the Corn made a tolerable Appearance during the Summer, but was not equal in Point of Produce, to what might have been expected, had the Season been more favourable.

As this Experiment tended but to one Question, it is not necessary for me to enter into particulars respecting the Expence which attended it ; because every Man who is acquainted with Country Business, will be sensible, that this Experiment must be attended with considerably more, than had Loss and Gain been the Account to be kept ; for the Manner of sowing was tedious, and the Manner of reaping much more so ; because one Kind of Wheat was first reaped, and must have been disposed of, before a second Kind could be reaped ; in order to put it out of the Power of the Carelessness or Inattention of the Reapers to mix the different Kinds of Corn.

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The 24 Ridges of Cone Wheat produced 7 Barrels, 13 Stone, and one Pound. The Red produced 6 Barrels, 17 Stone, and 6 Pounds, and the White 6 Barrels, 12 Stone, and 13 Pounds.

Thus we see, that the Cone Wheat produced more than the Red, by 15 Stone, and nine Pounds, and more than the White, by one Barrel and 2 Pounds, and that the Red produced more than the White, by four Stone and 9 Pounds.

The Cone Wheat was much better Corn than that which grew in the large Field I have already spoken of, but by no means equal to what I have had in former Years.

There was some Smut in this Corn, but in no proportion to what there was in the large Field, but none that we could discover in the other two Kinds.

A Circumstance, which seems to confirm, what I suggested before, when speaking of the other Field, that from the largeness of the Ears, it retains, and is more attractive of Moisture, than the other two Kinds; and therefore seems strongly to indicate, that great Wet, and extraordinary Dews, are productive of Smut; but this is a Subject which I am almost afraid to touch upon, as I almost despair of ever discovering the real Cause, with accurate Certainty; for it seems to have baffled the Enquiries of the most ingenious and capable, who have entered upon it; and yet we have not been without Writers, whose Vanity has inflated them with Exultation, at their imaginary Segacity, in accounting for this Disease; but the Papers of such, have appeared, as it were in the Morning, and like the Sun, disappeared in the Evening, never to trouble the Public by a second Perusal.

The red and white Wheats, escaping the Smut, is a strong Indication that they are better adapted to the Climate of Ireland, than Cone; and that they are more robust, although they are not so in Appearance.

The

The red Wheat was better Corn than the Cone, but even that was not so good, nor so bright as the White, for the latter, when cleaned from the Chaff, was what the Farmer and Baker calls a fine bright Barrel of Corn; but the Grain was smaller, than it would have been in a more favourable Season.

The Smut being less severe to the Cone Wheat in this Field, than in the large Field, already spoken of, I cannot account for, in any other way than this.

The large Field, from its great Size, must be more exposed to every Point of Wind, than the smaller one, but the large one is more particularly exposed to the West, and North of the West.

The small Field, is particularly well defended from those Points, by very lofty Hedges; and the North of the West, bears upon a Corner of the Field; the Hedges forming right Angles, which must very much break the Winds, and thereby greatly defend the Field.

It may seem somewhat adventurous, to risk an Opinion, to charge the Injury by Smut, to those Points of Wind; but from my Observations, I have found, that with these Winds it is, we have immoderate Rains in Ireland; and in the Course of six Years, that my Time has been devoted to the Service of the Public; we have had three failing Crops of Wheat; by Rust (commonly called Mildew) and Smut; and those have always happened with heavy Rains from the Westward.

Hence it seems, that we may naturally suppose at least, that wet Seasons are productive of Smut and Rust; if we may not apprehend, that Winds from the Westward, are somewhat contributory.

But I have certainly found, that in six Year's Observation, most of the Rain we have had in that Time, has been attended with high Winds, and Storms from that Point, or from the North or South of it, (but more generally inclining to the Northward, which also accounts

counts for its general Coldness.) And as the Cone Wheat suffered much less by the Disease of Smut in the small Field, than in the large one, I think it seems not improbable, but that point of Wind contributes to the Disease, because the small Field is much defended from that Point, whereas the large one is quite exposed to it.

However, I offer none of this Reasoning as conclusive; it is sufficient for me to inform the judicious Reader with my Observations; he will draw his own Conclusions; and I hope the Ingenious will not be unmindful in their Endeavours to discover the Cause of this Disease, to which Wheat, that King of Grains, (as some Writers have called it,) is so particularly liable; for Remedy cannot be applied for the removal of any Disease, either in the State, or common Occurrences of Life, until the Cause of the Disease be known; then the Remedy is frequently easy.

It now remains for me to say something for the Information of the reader, with Respect to the three Species of Corn, which I introduced in this set of Experiments.

True it is, that the Cone Wheat, produced the greater Quantity, upon equal Quantity and Quality, we may safely say of Ground from the Manner observed in sowing. For that, and other Reasons, which I own has always prejudiced me in Favour of this particular Species of Corn; it is with Concern, that I am now obliged to say, I cannot recommend its Introduction upon any Farm; because the past Year has shewn, that although it may be more Prolifick; yet, that it is more liable to Disease in severe Seasons, than the two other Kinds or even than a Fourth, which I introduced upon my Farm in the past Year, of which I shall have Occasion to say something presently, when I am to speak of another Experiment.

The Straw of the Cone is very strong and large, very fit for Thatch and Litter; but when the Farmer may be distressed for Fodder, that his Cattle are obliged to shift with Wheat Straw, this would be very ordinary for them. But the Circumstance of this Wheat, seeming
to

to yield more Bran than either the Red or White, is a very capital Objection to it ; and my Family inform me, that in handling of it in Flour, for the Purpose of making Bread, that there is a harshness in the Flour, like that of Barley Meal, made into a Kind of Doe for Poultry. Perhaps this Objection may be more prevalent in the past Crop, than it would be in a favourable Season.

The red Wheat is a Species of Corn, which I have also, always been fond of, from its lovely Appearance in the Field ; but Experience informs me, that it never has that Brightness either in Grain or Flour, which the white Wheat has ; neither will it, I believe, produce so much Flour as the White ; but of that I am not certain, as I have not had an Opportunity of examining this Point, with that Accuracy which I intend to observe.

And as I do not pronounce upon this Circumstance with Certainty, I shall, so long as I shall have the Honour to continue in my present Occupation and Service, endeavour to repeat this comparative Experiment, until I shall be enabled to give the Public some accurate Information, not only upon the first Question, which this comparative Experiment tended to ; but also upon the several consequential Ends which it leads to ; and will eventually answer with more Accuracy, than any other Manner of sowing or enquiry can possibly do.

And for this Purpose, I hope to introduce a greater Variety of Wheat, since I find, upon carefully examining Sheaves, that there are different Species of the Red and White.

But the Tedioufness and Labour, there is in separating Corn, Ear by Ear, and that by my own Hand, as must be the Case upon such an Enquiry, in order to obtain distinct Kinds for Seed, will apologize for me to the Public, that my Experiments in this way, cannot immediately be very extensive.

An

An Experiment upon Ground which had born four Drilled Crops in Succession; by manuring the Intervals or Furrows of the preceding Crop, for a 5th drilled Crop.

By referring to my Report for the Year 1764, Page 35, and 38, the Reader will find, that a Part of one of my Turnep Fields for that Year, was manured with shell Marle; another Part with native Earth, and the remainder of the Field with Compost, as described in that Report.

Two Acres of this Ground, has ever since been devoted to the comparative Experiment, between the Drill and Common Husbandry, as hath been already treated of in this Report; another Part contains my Field Plantation of transplanted Lucern, and the remainder has been under the Drill Culture ever since.

After the Turneps of 1764, this Ground was, in the Spring 1765, drilled with Barley, in Autumn 1765, and Autumn 1766, drilled with Wheat.

The Report of 1764, will shew that Part of the Ground was very indifferent, as accordingly were our Crops, for they are much guided by the Richness or Poorness of the Ground.

This poorer Part of the Field, I was inclined to try the Experiment upon, of sprinkling Manure in the Intervals of the preceding Crop; in order to ascertain by a actual Experiment, what would be the Event, for carrying on a Succession of drilled Crops, for a long Term of Years; and therefore I executed this; so that the Reader will understand, that our 5th Crop stood over the Manure, which was put in the Intervals or Furrows of the 4th Crop.

From this Experiment, I own I had great Expectations, but I was as much disappointed in the Event, for there

there was no removing the Weeds by the Horse Hoe, which rose amongst the Corn, and immediately upon the Verge of that Part of the Ridge, which the Hoe Plough does not touch; and they were so prolifick by the Wetness of the Season, and I suppose the Seeds which probably were in the Manure, and the Vigour which that also contributed; that as fast as I removed them by Hand, and Hand Hoes, they seemed to rise again like Hydras; insomuch, that indeed they were very troublesome to me; and must have been very injurious to the Crop.

The only View which I had in this Experiment was, that of invigorating the Ground, thereby to discover, how far the Drill Husbandry may be extended by a Succession of Crops without Intermission, by the Aid of Manure; but if the Manure used in this way, be Dung or Compost; I own that I am obliged to say, the Weeds will be found very troublesome; but perhaps Manure which does not contain the Seeds of Weeds, may answer better.

However, I fear a Succession of Crops of Corn cannot be carried on for any long Time, without introducing Turneps every third or fourth Year, to clean the Ground, which they and the Horse Hoe together will effectually do; by which Means, I do believe Crops may be obtained without Intermission, to the end of Time.

The kind of Wheat I sowed in this Piece of Ground, is a sort of white Wheat, and is known by a few, under the Name of Egg-shell Wheat. It appears to produce a small Ear, and short Straw; the Grain is fine, the Skin thin *, its Flour very Good and White, and the Corn affords but little Bran.

In about two Acres and an half of Ground sown with this Corn in the past Year, I had only 12 Barrels, and a few Stones of Corn; but much may be charged to the Season; and this Corn had a little Smut, the Exposure being a good deal to the Westward.

* And thence I suppose takes the Name of Egg-shell.

When

When I come to renew my Comparative Experiments, between the different Species of Wheat, I intend to introduce this Egg Shell Wheat as one of the kinds, for a Gentleman or two of my Acquaintance has it, and they speak largely in its praise.

Comparative Experiments between different Species of Turneps, sown in Drills; and in alternate Rows.

My Report for the Year 1764, sufficiently proved the Superiority of the drill Husbandry for Turneps, not only in Point of Produce, but in many other Advantages and Conveniencies, as will appear to the Reader, by referring to that Report.

As that Question was conclusive, as to which Husbandry is to be preferred for Turneps, it was unnecessary for me to enter into an Experiment of that kind; but which *kind* of Turneps are most profitable to the Farmer or Grazier, I considered as a Question of Importance to ascertain; and therefore, as I had about two Acres of Ground, which had produced Potatoes, in the Summer of 1767, I determined to introduce a comparative Experiment upon this Ground, between as many Kinds of Turneps, as I could procure the Seed of.

For this Purpose, I ploughed the Potatoe Ground, after the Potatoes were taken off, in order to give it the Benefit of a Winter and Spring Fallow, by which Means, my Ground was in fine Order, when I came to sow the Turnep Seed.

Preparatory to this, I threw the Land into Ridges five feet wide; in the Manner which I have heretofore described in my former Reports.

The Species of Turnep Seed which I endeavoured to procure were of six Kinds, *viz.* The Red, commonly called the Red Sheep Turnep, the White Norfolk, the
White

White Tankard, the Red Tankard, the Green Turnep, and the Yellow Turnep.

The Manner which I pursued to sow these different Kinds was the same as that which I followed in sowing the different Kinds of Wheat, as already mentioned ; by beginning on one side the Field with one kind of Seed, and sowing every sixth Ridge through the Field ; and then began with another Kind, and sowed that, and the remaining four Sorts in like Manner ; so that the six Kinds stood in alternate Rows through the Field, each having an equal chance of Ground, in point of Quality ; and they were all sown on the 30th. of June.

The Turneps were thinned by Hand in their Infancy, and Horse Hoed, in the manner already described in my Report for the Year 1764 ; so that I need not enter into the Particulars of those Circumstances, but for the Information of the Reader, refer him to that Report.

The Turneps escaped the Fly, and every other Accident to which they are liable, and they thrive very well.

But it was not a little provoking to find, that I had been deceived in one of the Kinds of Seed ; for that which was sold to me for Red Tankard, proved to be the common Red Turnep ; all the rest were pretty faithful, except that the White Tankard and White Norfolk were a little mixed ; however, they were very fine Turneps. Of the Red Tankard I had but two Turneps that I could find in the whole Field, and as they were very fine Ones, I took them up, and have transplanted them for Seed.

Being disappointed in the Red Tankard, I have only to give an Account, of the Produce of the five other Kinds.

That I might be enabled to do this with accuracy, I attended on the first and second of January 1769 in the Field, to see a Row of each Kind immediately ad-
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joining

joining each other pulled, and as each Row was taken up, they were drawn home in Carts and weighed, the Weight of each kind were as follows.

	T.	C.	Q.	lb.
No. 1. The Red, or Sheep Turnep	1	15	1	14
No. 2. The White Tankard	1	19	2	6
No. 3. The Yellow	1	8	2	0
No. 4. The White Norfolk	1	16	2	0
No. 5. The Green	1	2	0	0
	8	1	3	20

Now I shall compare the acreable Produce, by first examining our Quantity of Ground in each Ridge, in order to ascertain how many of them will be required to make a Plantation Acre.

The Ridges were 30 Perches in Length, which being multiplied by 21, shews they were 630 Feet long; and being 5 Feet wide, we are to multiply the Length by the Breadth, and our Answer will be 3150, which are the Number of Feet of Ground in each Ridge. This is to be the Divisor of 70560, which are the Number of Feet in a Plantation Acre; and our Answer will be 22, and a Fraction of 1260 Feet.

Thus we find, that 22 of our Ridges make a Plantation Acre, wanting 1260 Feet, or $\frac{1}{6}$ of an Acre.

No. 1. The Quantity obtained from a Ridge of the Red Turneps we have seen, was 35 Hundred, 1 Quarter, and 14 Pounds; which being multiplied by 22, amount to 38 Tons, 18 Hundred, and 1 Quarter. To this we are to add the Fraction of 1260 Feet, in Order to make up the Acre; which according to the Produce of the Red, is something more than 20 Ounces to a Foot; which Growth upon 1260 Feet, amounts to 14 Hundred Weight and 7 Pounds; which being added to the Produce of 22 Ridges, makes our acreable Produce of the Red Turneps 39 Tons, 12 Hundred 1 Quarter, and 7 Pounds.

No.

No. 2. A Ridge of White Tankard we have seen afforded 39 Hundred, 2 Quarters, and 6 Pounds, which being multiplied by 22 amounts to 43 Tons, 10 Hundred Weight, and 20 Pounds; and this Produce is in the Proportion of $22\frac{1}{2}$ Ounces to a Foot, which upon our Fraction of 1260 Feet, amounts to 15 Hundred Weight, 3 Quarters, and 6 Pounds; which being added to the 43 Tons, 10 Hundred, and 20 Pounds, makes our acreable Produce of the White Tankard, 44 Tons, 5 Hundred, 3 Quarters, and 27 Pounds.

No. 3. A Ridge of Yellow Turneps we have seen, afforded 28 Hundred, and 2 Quarters, which being multiplied by 22, amounts to 31 Tons, and 7 Hundred Weight, which is in the Proportion of a trifle more than One Pound to a Foot; and therefore the Fraction of 1260 Feet, amounts to 11 Hundred Weight, and 1 Quarter, which being added to the above Produce of 22 Ridges, makes our acreable Produce 31 Tons, 18 Hundred, and 1 Quarter.

No. 4. We have seen, that the Ridge of White Norfolk afforded 36 Hundred, and 2 Quarters, which being multiplied by 22, amounts to 40 Tons, and 3 Hundred, which is in the Proportion of something more than 20 Ounces and $\frac{3}{4}$ to a Foot, and therefore our Fraction of 1260 Feet, affords 14 Hundred, 2 Quarters, and 10 Pounds, which being added to the above Produce of 22 Ridges, makes our acreable Produce of the White Norfolk Turnep, 40 Tons, 17 Hundred 2 Quarters, and 10 Pounds.

No. 5. We have seen that the Ridge of Green Turneps, afforded 22 Hundred Weight, and 7 Pounds, which being multiplied by 22, amounts to 24 Tons, 5 Hundred, 1 Quarter, and 4 Pounds, which is very near the Proportion of 12 Ounces and $\frac{3}{4}$ to a Foot; and therefore our Fraction of 1260 Feet, affords 6 Hundred Weight, and $22\frac{1}{2}$ Pounds, which being added to the above, makes our acreable Produce 24 Tons, 11 Hundred, 1 Quarter, $26\frac{1}{2}$ Pounds.

For the more immediate Convenience of the Reader, I shall now state the different Kinds in a Sort of Table, by which, at one View, the Produce of the different Kinds will appear; and I own, I am not a little provoked that I cannot add the Red Tankard, as a sixth Kind as I intended; and I cannot but consider it as very criminal in Men, that they will not furnish the thing their Purchaser calls for, the Disappointment is very aggravating; particularly in my Case, because I wait an Year to ask a Question of the Earth by Experiment for the Information of the Publick, and my own Satisfaction; and truly, I then find, that I have paid a Seeds-man, for a thing which I did not buy of him; have lost my Time, Care and Expence; and am disappointed in my Enquiry, by an Imposition, which ought to mark his Name, could I allow myself to brand him with such a tipe of Infamy. And what renders this Kind of jesuitical Fraud more provoking is, that I have been frequently treated in this Manner.

A Table, shewing at one View, the acreable Produce of five kinds of Turneps, sown in alternate Rows, under the Horse-hoing Husbandry.

	T. C. Q. lb Pounds.			
No. 1. The Red or Sheep Turnep	39	12	1	7 or 88739
No. 2. The White Tankard	44	5	3	27 or 99231
No. 3. The Yellow	31	18	1	0 or 71484
No. 4. The White Norfolk	40	17	2	10 or 91570
No. 5. The Green	24	11	1	26½ or 55060

Thus we see, that the Yellow and Green Turneps, seem to be out of the Question in Point of Produce, for the Purpose of the Farmer or Grazier, for they afford considerably less than either of the other Kinds, particularly the Green.

But the Contrast seems to be between the Red No. 1, the White Tankard No. 2, and the White Norfolk No. 4, and this comparative Experiment seems to declare in favour

favour of the White Tankard, because that we see, has afforded near three Tons and a Half more than the White Norfolk, and near Five Tons more than the Red; and the latter, one Ton five hundred less than the White Norfolk; but these are differences in Point of Produce, which I think should not be considered as conclusive upon one Experiment, with respect to which Kind the Farmer should choose for his Purpose of these Three; tho' I think the Experiment sufficiently conclusive for him to exclude at least the Green, if not the Yellow also; and therefore, when I repeat this comparative Experiment in the ensuing Season, I intend to omit the Green; the Yellow I intend to continue for a Reason which will appear presently.

I shall now trouble the Reader with a few Observations, upon the Quality of these different kinds of Turneps, so far as they relate to the Purpose of the Farmer or Grazier.

The very Name of White Norfolk, sufficiently indicates, that in the county of Norfolk, the large White Turnep is preferred by the Improvers and Farmers of that County and Neighbourhood of England: a County, to the Honour of its Inhabitants, in which perhaps, the Improvements of barren sandy Land has been carried higher, and that to almost an incredible Extent, than any other Part of the Kingdom; and that chiefly by Turneps: and I sincerely wish, that the Improvers of Ireland, would be animated by such an Example to a more general Culture of a Plant so valuable, not only in itself; but also in its Consequences; for there is no Crop that I know of, or any Fallow, that the closest Application and greatest Expence, which will so effectually clean Ground for Corn, or any other Purpose whatsoever; for they not only destroy all Weeds, but so finely prepare Land, that were I to lay out a new Garden, Turneps should be my first Preparation.

The Ground which I had under the Kinds already mentioned, after having been once ploughed, is now in such a state, as would delight any Man to see, who is a Judge of a fine Preparation of Land.

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The Reader is not to conclude from hence, that he has nothing to do, but to throw Turnep Seed into his Ground, in the slovenly, idle, and inconsistent Manner which I have frequently seen, and that the Turnep Seed will prepare his Land for Corn! No, it is the Growth of Turneps which prepare it, and not their starving; and therefore, whoever attempts this Culture, must first perfectly reduce the Land; manure it well, with such Manure, as his Experience hath shewn, best to agree with the Ground; and upon his Turneps coming off, he will find his Land in high Condition for any Kind of Purpose, particularly, if they have been cultivated in the Drill Way.

This Turnep, the White Norfolk, shews the improvers of that County, to be judicious in their Observations; for this kind of Turnep, seems to be particularly well adapted from its make, for keeping in the Winter, for they rise upon their head or upper Part, and are in their Shape, not unlike the large end of an Egg, by which they compleatly throw off the falling Rains of the Winter, and therefore seem particularly well adapted to the Use of the Farmer.

The Red Turnep, commonly called the Red Sheep Turnep, seems to be the Kind preferred in Ireland, for I have observed that to be the Sort, chiefly cultivated here, from an Opinion I have been told, that it is more robust than any other Kind.

I am sorry I cannot confirm that Opinion, for I have found it more perishable, than the Tankard or White Norfolk; and that from a very natural and striking Cause.

The Apple of this Turnep (the Red) is rather flat, and about the Neck, where the leaves unite, the Apple is indented; some indeed, more than others.

In these indented Places the Rain lodges, as it were in a Cup, and very soon brings on Putrefaction: a Circumstance

cumstance which shews I think, that they are not so good a Kind, as either the White Norfolk or Tankard; because no Water can lodge upon either of those Kinds; and in this comparative Experiment, they (the Red) appear not to produce so great a Quantity, from equal Culture, and equal Ground.

The Leaves of the Red decay much sooner than those of the two other Kinds; very probably from the Circumstance of the Water lodging in the indented Places of the Turnep; and I have imagined, that upon cutting several of these three Kinds, that the Red are not so firm in their Texture as the White Norfolk and Tankard, but this is a Circumstance which I shall examine repeatedly in future Crops, in the course of my repeating this Experiment.

The Red Turnep being flatter than the White Norfolk or Tankard, renders it considerably dirtier, when taken up for the purpose of pasturing Cattle upon Meadow, or in the Bails; whereas, the Norfolk and Tankard, from their rising considerably above the Ground, are always pretty clean, particularly in dry Weather, for the Bottoms, which are in the Soil, penetrate like a Cone, and therefore in the Drawing, leave the Earth behind; whereas the Red, and every other flat Turnep, generally bring up more or less Soil, adhering to them.

From those Circumstances, I think it seems probable, that the White Norfolk and Tankard Turneps, are the Kinds most worthy the Attention of the Farmer and Grazier.

The Tankard Turnep, seems to be a Kind particularly well adapted to stiff and wet grounds, because they stand so much above the Soil, and the Part which enters it seems to penetrate not unlike a Dibber; and whether they are to be consumed upon the Ground they grow, (which I consider a bad Practice) upon Meadow, or in the Bails, the Cattle or Sheep, can separate them much sooner and easier, than they can any flat Turnep, and none

none are so easily sliced, their Shape contributing very much to the Dispatch of that Business.

The Leaves of the White Norfolk and Tankard, are considerably more luxuriant than the Red. The Yellow and Green produce scarce any Leaves at all, comparatively speaking.

We have seen they are far deficient in Point of Produce, from either of the other Kinds; but I must not omit to say, in Favour of the Yellow Turneps, that they are much firmer in their Texture, than any other Kind, that I ever have cultivated; and therefore promise to be very durable in the Winter; unless their being so immersed in the Soil, shall contribute to their Putrefaction, that I may be able to inform the Public on this Point, I shall continue the Yellow Turnep, when I repeat this Experiment.

Some Account of the Effects of feeding Store-Cattle, Plough Bullocks, and Milch Cows, with the Turneps already mentioned.

Of the different Kinds of Turneps which I have already mentioned, I had 44 Ridges, which I have already shewn, amounted to near two Acres.

By adding together, the Produce of the five Ridges which I weighed, we have already seen they amount to 8 Tuns, 1 Hundred, 3 Quarters, and 20 Pounds, and therefore our actual Produce upon the 44 Ridges, was 71 Tuns, 4 Hundred, 3 Quarters, and 24 Pounds.

Had the Field been sown all with the Kind, which appears to have produced the greatest Crop, viz. the white Tankard, our 44 Ridges would in that Case, have produced 87 Tuns, 1 Quarter of an Hundred, and 12 Pounds; so that by the comparative Experiment, 15 Tuns, 15 Hundred, 1 Quarter, and 16 Pounds, of Turneps were lost; however, that shall not prevent my repeating

peating the like Experiment, because I consider it as a very material one.

With our actual Produce of 71 Tuns, 4 Hundred, 3 Quarts, and 24 Pounds, I began on the 2d of January, 1769, to pasture my horned Cattle, which consisted of 42 Head, including plough Bullocks, Milch Cows, Heifers, Stirks, and Yierlings.

The Cows which remain of the Stock I had in the Year, 1764, when I had the great Quantity of Turneps, and which my Report of that Year gives an Account of, and my plough Bullocks, which were only Stirks at that Time, all took to eating the Turneps immediately, notwithstanding the long Interval of Time, for I have had no Turneps since, except those of 1765; which it may be remembered, miscarried with me, but the other Cattle obstinately refused them for three or four Days, save, that they nibbled at the Leaves a little; and after those few Days were elapsed, the Cattle of all Ages, eat the Turneps very freely, and became indifferent about the Leaves.

For their Pasture in the Day time, I had the Turneps spread upon a Meadow of about two Acres, beginning on one side of the Field, and covering a Ridge at a time, and so proceeding regularly, Day after Day, through the Field; and every Evening Turneps were given to the Cattle in their Bails.

Proceeding thus, my 44 Ridges of Turneps, maintained, with a small Allowance of Oat Straw in a Morning to the Store Cattle, and a little Hay to the Milch Cows, 42 Head of Cattle six Weeks.

Here we reduce this Business to Practice in a pretty large way; and I wish the Farmer, Grazier, and Dairy Man to consider how important a Consideration this is; particularly, when they compare what two Acres of their best Meadow would do in Pasture in the Summer, with 42 Head of Cattle upon it; their Answer would be that in six Weeks they would be starved. Can he then, have a stronger Invitation to the Culture of Turneps, when

when he thus sees what a Quantity of Winter Pasture they afford.

But there are yet further very material Considerations; for by spreading the Turneps in the Manner I have already mentioned, I have gone over two Acres of Meadow; and every Man will imagine, that 42 Head of Cattle standing for the Days of six Weeks upon such a Piece of Ground, must have afforded by their Dung and Urine, a pretty handsome dressing to it.

Besides this, I found another very inviting Effect from my Pursuit of this Experiment; for before I began to use the Turneps, the distress of my Family for Milk was very great, and will be better conceived by large Families, where there are Half a score young People, and some Milk Drinkers besides, as is my own Case, than I can describe.

For the first three or four Days indeed, the Milk had a strong Flavour of the Turneps, even to be disagreeable; but that presently went off.

We had afterwards, a great redundancy of Milk, and besides that churned ten Pounds of Butter a Week; so that in many Particulars, we see, there are great Conveniencies, as well as Advantages arising from the Culture of Turneps; and therefore I earnestly recommend to the Farmers of Ireland, that they bend their Attention, at least to the having a few Acres under Turneps every Year; their Culture is cheap and easy; and the purchase of the Seed a mere Trifle,

And Gentlemen of landed Estate will permit me to recommend it to them, that they urge their Tenants of small Farms to an undertaking so easy, so cheap, so advantageous; and so much within their Power; since, by this Experiment, I have reduced the Practice to their own preparation of Ground; namely that of Potatoes, which their Turneps may follow; whereas, were they obliged to devote their Dung to the Purpose of Turneps, and thereby, give up their Potatoes, I should despair of their adopting the Practice; but in this

this Case, they may first have their Potatoes, then their Turneps; after which, their Ground will be in better order for Barley, than were they to sow it after Potatoes, and Barley generally brings a better Price than Bere.

And if with the Barley, such Occupiers can be prevailed upon to sow about 20 Pounds of red Clover Seed to the Acre, for the Purpose of soiling their Horses and horned Cattle during the Summer; that, with the Turneps, would enable them to manure double, and so as they increase triple, and quatriple the Ground they ever had done, or can possibly do, from their present Practice, as I shall demonstrate presently, when I enter upon another Subject.

But to return to my Point of introducing the Culture of Turneps in Drills, amongst the midling or poorer Farmers of Ireland; I am to observe, that I am aware of the Objection which will be at once offered, by way of Impediment; for, from a Languidness attending the Pursuits of one race of Men, and the Exercise of the Invention of another set, to raise Difficulties and Obstructions; the third have enough to do, to carry on and execute the general Business of Life; but what a *shivering* Race of Mortals would the two first sets be, were it not for the Eagerness of the third in their Pursuits, every Man of an active Spirit, can picture to himself.

I say, I am aware, that it will be asked, by way of Objection, where must these kind of Farmers get the Drill and Hoe Ploughs, and Drill Harrows, to execute this Business?

To remove this Difficulty, let the Man who shall be excited to the Attempt of cultivating Turneps, after making his Ridges (if his Landlord has not the Instruments to lend him) just level the crown or centre of the Ridges, with an Iron-toothed Rake, then open a small Furrow along the middle with an Hoe; and to sow the Seed, let him put it into a powder Horn or small Bottle, and by his Fore-finger, upon the Mouth of the Horn or Bottle, in the Manner that he would prime a Gun, let the Seed trickle out, as he passes along, only that he must
sow

sow it as thin as possible; this being done, for covering the Seed, let him draw the back of the Rake head, along the Ridge, in doing which, he may walk pretty fast.

For the Hoe Plough, any Man that can make a Plough, will make him a small one to work with two Horses, one before the other; and suppose it is not quite perfect; yet, it will introduce the Practice; and Success will encourage the Pursuit; but surely, a Landlord would not suffer such a Tenant to be long without a good Hoe Plough, if it could be had, since the Expedients which I have mentioned, answers for all the rest.

The Manner of making the Ridges, is no more than the six sod Ridges, which are made for Wheat, almost through the Kingdom.

Let us suppose now, that by this Attempt, a little Farmer should, after thinning his Turneps, so that every one occupies a Foot in the Row, and that one with another, each Turnep weighs five Pounds; in that Case the Ridges been five Feet wide, every Foot of Ground, would produce a Pound of Turnep Food; and therefore an Acre Plantation Measure, containing 70560 Feet, would afford a Crop to him, of 31 Tuns, and 10 Hundred Weight.

Would not this be a prodigious Acquisition to a poor Man, for his little Stock of Cattle in the Winter, abstracted from the Circumstance of helping his Meadow, saving his dry Fodder, adding to his Dunghill, and increasing his Milk and Butter?

And I am well satisfied that there are Grounds which will produce much greater Quantities of Turneps, than I have been able to obtain. The largest of my Turneps this Year weighed but 12 Pounds; I have had them of 15, which indeed were the largest I ever had; but I have heard People talk of 20 Pounds, but I never had any of that Size.

In

In the Explanation of my list of Instruments, 3d Edition, 1768, when speaking of the Turnep slicing Engine, p. 24, I have said, "I continue to give this Instrument a Place in my List; but from the Method which I have lately pursued in feeding my Cattle with Turneps in the Winter, I have, in a Manner, rendered this Machine unnecessary, of which I shall furnish the Publick with some Account in my Report for the Year 1768."

When the Cattle are put to pasture upon Turneps, which have not been used to them, it is necessary to slice them, but if they be large no Danger can ensue, for those which have been used to them, will scoop them very handsomly, when thrown on a Meadow.

To slice them with Expedition, I contrived the Engine N^o. 90 in my List, but the Number of Times which this Method requires them to pass through the Hand, is attended with some delay; and therefore, when I spread them upon the Meadow, one of my Scarificator Coulters is put into the Hand of a Man or Boy, who with that, chops them very expeditiously, and they remain in the Place.

When they are brought home to the Bails, they are thrown down, and in like Manner, by holding the Turnep upon the Frame of the Bails, two or three Blows does the Business, so that by this Method, my Turneps have been cut with much more Expedition, than any Machine can do them. Hence, the Turnep Engine seems not to be necessary, in this Business.

Conf-

Considerations, upon the most profitable Method of supporting Horses, Dairy Cows, Plough Bullocks, and Store Cattle, reduced to Practice, in the summer of the Year 1768.

I am now to enter upon a Subject, which, from the strong Impression it has made upon my Mind, by a long and thorough Consideration of it, I conceive to be of as much Consequence to the Landholder, as perhaps any Subject I have ever yet entered upon.

Much has been said, and that, I am fully persuaded, with a great deal of Reason, in the Recommendation of Artificial and Exotick Grasses; and yet we find but few Farmers who adopt them, even in England, and much fewer in Ireland.

In England indeed, Clover is very generally introduced, and in some Parts of the Kingdom, Sainfoin is very largely used, but in Ireland, I am sorry to observe, that even Clover has made but little Progress, and Sainfoin is scarcely known.

In this general Observation, it will hardly be imagined, that I mean to include Gentlemen, who cultivate various things of this Kind, for their Amusement, when they are in the Country; but the Farmers in general, are much unacquainted with them, and therefore very unwilling to bend their Attention to, or hazard any Expence, Trouble or Labour for them; until by repeated Trials, and long Inspection, at the Expence of Gentlemen, they shall be invited by small Attempts, to introduce little Quantities upon their Farms.

This being the Case, I have long considered, that it might not be amiss to reduce to practice in a pretty large Way, a Method of maintaining their Cattle, at a much less Expence by natural Grass during the Summer, than they do at present.

In

In the Summer of 1766, I attempted this undertaking upon Speculation, but my unfortunate Fire over-
set that Scheme ever since, until last Summer; when I
resumed my Project, of bailing up all my horned Cat-
tle, and confining my Horses during the Summer, as reg-
ularly as I do in the Winter.

For this Purpose I had reserved a sufficient Quantity of
Straw in order to bed them properly, that I might effec-
tually accomplish my Point, in all its Views, and to feed
them, I devoted a small Meadow containing near two
Acres; but as the Ground was not in the Condition I
wish to have it, the Grass was not ready for my Pur-
pose, so early as I expected.

However, the Walks in a small Orchard I have affor-
ded tolerable Grass by the middle of May; with that,
and about half an Acre of transplanted Lucerne; I be-
gan to fodder all my Cattle of every Kind; concluding,
that before this resource should be exhausted, the Mea-
dow would be ready.

My Stock at that Time, consisted of 38 Head, in-
cluding Horses, of which I had seven Cows, Plough
Bullocks, Heifers and Stirks.

The Grass of the Orchard and Lucerne, carried them
on to the second Week in June, when I began upon the
Meadow, by mowing the Grass, and bringing it Home
to the Bails, as I did with the other, every Afternoon,
against the Cattle came in, in the Evening; and this
little Meadow plentifully foddered the 38 head of Cattle
every Night for six Weeks; but I gave them none in a
Morning, which I think was wrong; but next Summer
I will fodder twice a Day.

The Orchard, after the Meadow began to supply
them, was devoted to my young Calves, of which I
bred eleven: these it will be imagined, consumed a great
deal of Milk, besides supplying the Family and making
Butter.

When

When the horned Cattle were turned out in a Morning, they were drove to a Common, adjoining my Farm, which was calculated to give them Air and stretch their Legs, and not for what they could pick up, for the Pasture is always over-stocked, and consequently is bare.

The Horses and Plough Bullocks went to their Labour, and had Soil every Day at Noon.

By this means, I had not a four footed Beast pasturing upon my Farm (except the Calves in the Orchard) all the time. After the Meadow devoted to this Purpose was exhausted, I had recourse to my Head-lands, and other bits of Grass in my Corn Fields, insomuch that I had not a Beast lying out, from the Time of taking them in, the latter end of October, 1767, until after Harvest, 1768; and then I turned them all out, to eat up the after Grass of my Meadows, and what they could find in the Stubbles.

Thus I carried a Stock through the last Summer, with not more than four Acres and an Half of Ground, including the Meadow, Orchard-walks, Lucerne and Head-lands, which 25 Acres of the best grass Land I have, would not have maintained for that Time, in the ordinary way of using the Grass.

Surely, this Consideration, must be very inviting to every Man who wishes (as I suppose every one does) to support his Stock of Cattle, at as small an Expence as he possibly can.

But this is not the only Advantage arising; for the pleasing Circumstance of the Cattle being out of all possibility of breaking into, and injuring either his own, or his Neighbours Corn or Meadow, is such a one, as will permit him to lie down and take his rest, without any Apprehensions of Danger, from, or to his Cattle.

Besides this, there is yet another very important Advantage arising from this Practice in the Article of Dung; for during the last Summer, my Cattle made such a Quantity, as was really worth a large Sum of Money; and

and with what I made this Winter, to this 21st Day of February, added to that of the Summer, I have a Dunghil, 90 Feet long, 40 Feet broad, and 7 Feet high, which are 933 cubical Yards, and 9 Feet.

Let the Farmer consider what an Acquisition this is, either for Meadow, Tillage, or to follow his own Method, for Potatoes; and if he can then be prevailed upon, to sow Turneps in the Manner, and for the Purposes I have before recommended; every Year his Stock may be increased, his Tillage and Meadow enlarged, and consequently, greater accumulations of Dung; whereby, every Farmer, following these Methods, will become an Improver, instead of an Impoverisher of Land.

And I am not without hope, that this Practice will prevail more with the Land-holders, than were I to spend my Life in making Experiments to discover the best Culture for Artificial, and Exotic Grasses; because, hereby he is divested of all Fear of Miscarriage in his Crop, because he is perfectly acquainted with the Nature of common Grass, and therefore he can appeal to his own Senses, without resting upon the Judgment of another; he is not incumbered with any tedious Process, anxious Care or Expectation; neither is he confused with any Prolix reasoning, or troubled with any Machines, but those, which he has from his Infancy been acquainted with; namely a Scythe and Stone, and an Horse and Cart. These accomplish the whole Business; and his Crop is natural Grass. All he has to do, is to improve a bit of Meadow, that it may come in as early as possible, to accomplish which, if the Method I have recommended by Turneps, shall not be adopted, every Man knows the Manner, and therefore I need not enter upon it here.

To examine this Point a little further, by turning out such a stock of Cattle, as I maintained last Summer in the Manner already mentioned, into ten Acres, suppose of very good Grass, they would have lived well for a little while, but every Man who is acquainted with this Business knows, that 38 head of Cattle, would soon dirty the Grass in such a Manner, that they could not,

E

neither

neither would they eat it; and then another Field must be devoted to them; and that would soon be in the same Condition; so, that at this Rate, as I know from expensive Experience, a Man would require for such a Stock, many Acres of Ground, for them to run over, in the Course of a Summer.

To examine the common Practice yet further; and it will be found, that the Cattle, by treading upon the Grass, damage and waste a great Quantity of it; and some they will not bite at all, whilst they can nibble at the young Growth. Whereas, when it is mown for them and lodged in their Bails, the long and short is mixed, and they eat it eagerly without any Waste.

I shall not pretend to say, that Cattle can be made Beef of, by this Practice, because I have had no Experience of it; but I hope to inform myself in that Particular next Summer, by trying the Experiment with a Cow. But that the Practice makes the Dairy Cows give great Quantities of Milk is certain; because last Summer I had but seven Cows, upon them, I raised eleven Calves, and furnished my Family with Milk and Butter; and we are always Sixteen in Number, ten of which are Children, who use a good Deal of Milk; and one of the Calves being intended for a Bull he had one entire Cows Milk.

I shall conclude with observing, that were we to give Attention to the Improvement of a few Acres of common Meadow, for the Purpose of supporting our Cattle during the Summer, in the manner I have just mentioned; that I cannot by any Means form a Judgment, what quantity of Food it might afford; it is not clear to me, but that it may approach very closely upon the Produce, of many of the celebrated exotick Grasses; and if so, when we come to consider the great saving, in Point of Expence, there is between the Improvement of common Grass, and the Culture necessary, for some of the artificial or exotick Grasses; it seems not improbable to me, but the former bids fair to afford nearly as large Profits, without any material Care, as the others can

Can, with the utmost Care and Expence ; but if I live a few Years, I shall be able I hope, to inform myself and the Publick with certainty, as to this Particular.

Considerations on the present Method of gathering, and saving Corn in Sheaf, with a Plan of a new constructed Barn, by which it is apprehended, the Business of gathering Corn may be executed for half the Expence now incurred ; and that thereby, Corn may be kept as long, and safer than it can be in Ricks, Humbly submitted to the Consideration of the Society.

The Combinations so generally adopted, by the Mechanics of the Metropolis of this Kingdom, in Defiance of all Law ; and in Contempt of all Virtue, Prudence and national Policy ; I am sorry to find, has, like a Contagion, diffused itself into the Country ; for the Conduct of Country Labourers, is become so intolerably intolent ; and their Combinations against the Farmer ; (and that more particularly if he grows much Corn) so insufferable, as well as insupportable, that Redress thereof, never was more wanting ; nor Expedients for lessening the Quantity of Labour, never more necessary.

What I have now to offer, I hope will have the Effect of lessening the Quantity of Labour, and consequently the Expence ; if Landlords will contribute to it ; for I do not expect that Tenants in general, particularly those who have short Tenures, can, or will undertake it.

In the Course of my Practice, in the business of Tillage, which has been pretty extensive, there is no Part thereof that I find so troublesome and vexatious, as that of Harvest ; to get through it with Safety and Expedition, a Man had need to have the Eyes of *Argus* ; for the Idleness, Impositions and Insolence of the

Labourers at that Season, for three Years past, has been beyond all Possibility of Bearing or Supporting ; to the very great Injury of many poor Farmers, to my Knowledge ; and I can truly say, to mine, in a great Degree.

The Expence of Reaping the Corn, I find to be the least : for the Manner of binding, gathering, and stacking in the Field ; then pulling down those Stacks again ; building Ricks, thatching them ; and the fine idle Way they have of making *Wangles*, as they call them, to thatch the Ricks, and the waste of Corn, with a Parcel of idle Fellows, at high Wages, amounts to such a Sum of Money, as is not to be conceived by any Man, but such as use the practice of it.

But the Expence dees not end here ; for those Ricks and thatch are to be pulled down again, and the Corn carried into the Barn upon Mens Shoulders for threshing, which not only causes great waste also ; but it is employing Men to undo that, which, at great Expence had been executed ; and what renders all this tedious Business more than ordinary provoking is, that the Men employed, devise every means they can to increase the Expence, in every stage of the Business.

Were I to proceed in minutely describing all the Circumstances, and their Tricks of Delay, to bring on, in their Sight, the *Sluggish* Evening, I should cover a great deal of Paper ; but as I wish not to take up the Time of the Reader, I shall only observe, that in a Course of six Years, it has cost me an Hundred Pounds for building, thatching and pulling down Corn Ricks ; abstracted from the intolerable Waste ; which, I am persuaded, is at least ten Times as much in Ireland, upon an equal Quantity of Corn, as it is in England ; and yet, scarcely to be avoided in this Country, where a large Quantity of Corn is to be gathered,

But to lessen these enormous Taxes to the Farmer, and to render him more independent of his Labourers, I now venture, at the request of several Gentlemen, to offer

offer to the Consideration of the Society and the Publick, a new Constructed Barn ; and if I have not been too much flattered, I may hope, that it will meet with Approbation.

All the Objections that can be offered to the lodging Corn in Barns for keeping, I believe are totally removed in this ; for it will be perfectly secure from Vermin, and always sufficiently exposed to the Air ; so that it may stand as long, if not longer, with Safety, in this Situation, than it can in Ricks.

The Size of the Barn, may be proportioned at the Discretion, of the Person who is to pay for the building of it ; and therefore the size I have fixed upon, is to be no determinate Rule ; but as it is calculated, for the Purpose of keeping Corn in the Sheaf ; the larger it is made, the better.

The

The Description of a Barn upon a new Construction, for the Preservation of Corn in Sheaf.

Explanation of the Ground Plan.

A A. The Bays, for lodging the Corn.

B. The threshing Floor.

C C. The Gates to enter the Barn with Cars, loaded with Corn in Sheaf.

D D. The Walls between the Bays, and threshing Floor, to rise as high as the Floors of the Bays.

E. A Crane is to be erected, for suspending a Beam and Scales, for weighing off the threshed Corn; and it is placed there, as being on the right Hand of the Thresher, and therefore out of the way of his Flail.

Explanation of the Inside.

A A. The Floors of the Bays, shewing the ends of the Joist, which are to be six Feet from the Ground; and covered with Boards well jointed.

B. The threshing Floor; to be made of what Materials may be chosen; But Oak Plank will be best.

C C. Houses for horned Cattle, under the Bays.

D D. Curtains which are to be drawn, when one Kind of Corn may be in one Bay, and another Kind in the other, to prevent the one Kind of Grain, which may be threshing, flying amongst the other; and also to keep the Wind from the Threshers, in stormy or cold Weather; otherwise the Barn will be very cold, when the Quantity of Corn in either, or both the Bays shall be below the Verge of the Roof. These Curtains are to be

be made of coarse Conaught sacking, which may be bought for 5 *d.* a Yard.

Explanation of one Front, or Side of the Barn.

A A A A A A. Are six large Windows, which are to be on each Side the Building, opposite to each other, in order to admit of a free Circulation of Air through the Corn; and they are to be neatly Weather-boarded, to throw off any beating Rains.

B. Is a circular Light, to admit Air, and to afford Light to the Threshers, when the Weather will not admit of either of the Gates being open; or when the Master shall choose to lock up the Men, thereby to guard against Frauds.

C. Is the Gate, one of which, is to be on each Side or Front: the Doors to be cut horizontally, across the Middle, to admit of the upper Hatches being open, when the lower may be shut: along the bottoms thin Iron should be rivetted on, to prevent Rats gnawing them; and instead of a Rabbit cut in the Sill, I would spike down a Bar of three Inch Hackney Iron, for the Bottoms of the Doors to shut against.

D D. Are Stones, in the manner of Eve-stones, to be well hammered and jointed, and to project six Inches, to prevent Vermin creeping up, and under these Stones, the Walls on the outside, all round, should be neatly, and smoothly plattered, for two Feet downwards.

E E E E E E. The Front, shewing the Passages into the Houses, under the Bays, for horned Cattle. Those are to be on one side only.

Explanation of the Gable-Ends.

A. Is a large Window, which I would have carried as high as may be; by which it appears I would not hip the Gables, because there will be little or nothing saved thereby; and by carrying them to the Ridge Pole, the Roof contains, by so much the more Corn.

B. Is the projecting Stone, to keep down Vermin.

General

General Explanations.

If any Person who may build this Barn, shall think that 20 Feet are not wide enough in the Floor for Thrashing, and laying the thrashed Corn on each Side; the cross Walls DD in the Ground Plan, may be thrown, as far back, as the Lines FF in the Ground Plan, by which the thrashed Corn, will lie commodiously under the Bays.

It doubtless will be observed, that the Building will be expensive, from the Coins, Blocks and Arches, being all Hammered Stone, but the whole can be executed in plain Rough Work, which will make the Building very cheap.

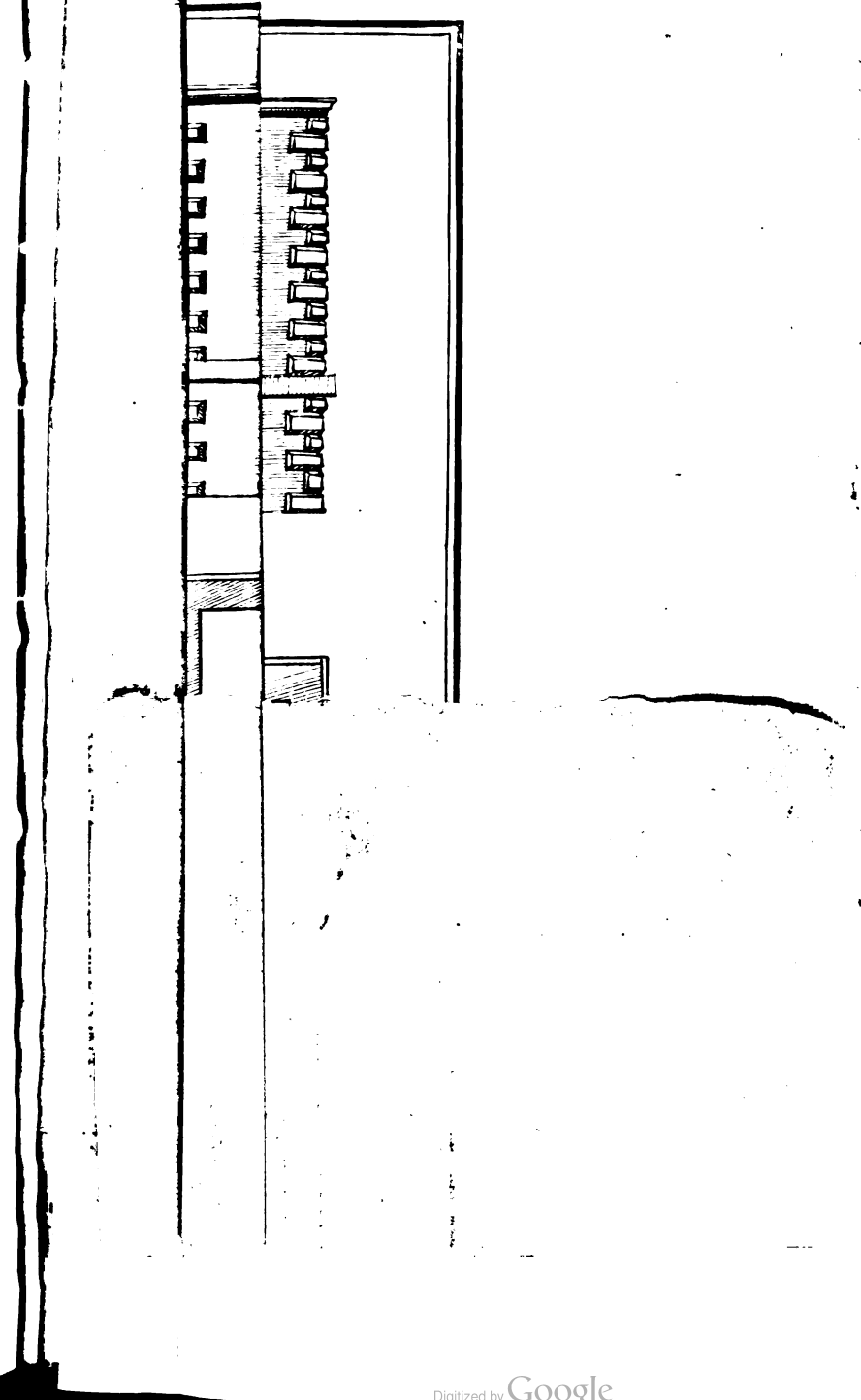
The Walls under the Joice internally, should be smoothly, and neatly plastered, for two Feet under the Joice, and between the Joice, neatly, and smoothly rendered, to prevent Vermin creeping up.

The Partition Walls DD in the Ground Plan, should be smooth plastered also, and the Returns all round. The Inside of the whole Barn, may, or may not be plastered, at the Discretion of the Owner.

From the Center of each Pier, under the Eve Stones, I would have a Joice pass across the Barn, by way of Ties, to prevent any Injury by Pressure against the Piers. Not that much is to be feared from the Corn, pressing outwards, because the Heads of the Sheaves are always laid inwards, and consequently, the Gravity inclines to the Centre.

From the Angles of the Returns, there are also to be a Joice for no other Purpose, but to carry the Curtains DD, as marked, in the Inside.

Gene-



General Observations.

The Conveniencies and Savings to the Farmer in such a Barn as this would be many ; some of which I shall name.

In making his Sheaves, much Labour may be saved, for four or five of the common Sheaves may be put into one Band.

The Corn need not be stacked in the Field, but may be staked, for a Day or two, and as fast as it is ready, may be taken Home, and lodged in the Barn; and in proportion as that is executed, so much will be safe from the Danger of bad Weather, Vermin and Pilferers.

The Expence of putting the Corn into the Barn, will be a mere Trifle, in proportion to that incurred, by the Accuracy which is necessarily observed in the building of Ricks; and in this case, no Waste at all is incurred, by unloading the Corn, because the threshing Floor receives every Grain.

In this Case, we shall not have from eight to a Dozen or fifteen fellows lying stretched upon the Mow, as we have upon a Rick, when any Accident happens, to interrupt the regular coming of the Carriages, as is often the Case.

None of that delightful work to the Men of making *Wangles*, (which approaches very near to the Phrase of counting Straws) or thatching at high Wages; nor no pulling down Ricks, or carrying the Corn in upon Mens Shoulders.

No repairing of Thatch in, or after Stormy Weather; no Damage received in the Corn from great Rains, by bad thatching.

No breaking a Rick, or other Interruption to the Farmer, if he wants to thrash a few Barrels, nor no waiting for a fine Day to put in a Rick.

No Vermin can get into the Bays of Corn; and if a Mouse happens to come from the Field in a Sheaf, (which is by no Means so probable in Stucks, as in Stacks, for in the latter they swarm) as soon as it wants Water, it will make its way out at the Windows to seek it, whereas in Ricks, Vermin of all Kinds, have nothing to do, but approach the Verge, and there they lick up the drip of the falling Dews or Rain, and therefore never quit the Rick, but carry on their Generation, so that in a few Months the Rick will swarm with young and old Mice. Hence is it, that we see the Verge of Ricks, mangled in the Manner they are, when they have stood any long Time.

I could name many other Conveniences which would arise in the use of this Barn to the Farmer, and many other Inconveniences attendant on the present Practice; but at present, I shall conclude here with only observing,

That I apprehend, there are few Places in Ireland, where this Barn might not be built for £100. in a plain way.—Are there many Tenants who would not pay a Landlord five Pounds *per Annum* for building it? And I hope there are not many Landlords who would refuse to execute such a convenient Improvement for an industrious Tenant at 5 per Cent.

I am aware it may be objected, that by raising the Floors of the Bays so high as six Feet, much Stowage for Corn is lost. I admit that; but then it is gained for the compleatly housing Cattle, or for any other purpose; and if we were to raise the Floors only two Feet, that Space would be totally lost, because no Use could be made of it; and besides that, Vermin would, from various Accidents, be more liable to get in, and to raise them three or four Feet, would render the Place underneath very inconvenient for any Purpose.

The

The Barn, according to my Plan, I conceive, will contain at least 300 Barrels of Wheat in Sheaf; and according to the size of the Farm, or quantity of Tillage thereon, the number of Barns may be increased, or the Size of one, if that be enough, diminished.

Thus I have troubled the Society with my Ideas, of a new Barn, and if I shall have the Honour to continue longer in their Service, I propose next Year, to trouble them, with a plan for a Granary upon a new Construction, for the Preservation of thrashed Corn; by giving it free Air, and frequent Motion, at so trifling an Expence, as moving almost any number of Barrels, at least as many, as the Granary shall be made to contain, three or four times, for Sixpence.

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Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains.

Journal of Management Education 30(6)p.789-804

Figure 1. The effect of the concentration of the *Agrobacterium* suspension on the transformation efficiency of *Agrobacterium* strains. The *Agrobacterium* strains were grown in YEA medium for 24 h at 28°C. The cell concentration was adjusted to 10⁸ cells/ml. The cells were then mixed with the plant tissue and incubated for 24 h at 28°C. The plant tissue was then cultured on the selective medium. The transformation efficiency was calculated as the number of transformants per 100 µg of plant tissue. The data are the mean ± SD of three independent experiments.

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INTRODUCTION.

To the R E A D E R.

WHEN I began this Factory, I had no Conception that the Demand would, in many Years, be equal to the Calls which have been, in the short Time since its Establishment, and therefore the Plan was originally calculated upon a small Scale. The unexpected Demand, I am sorry to observe, proves the Want of good Instruments for all the Branches of Agriculture in this Kingdom. Sensible of this Inconvenience, the Gentlemen who generously, in Behalf of their Country, bend their Attention to that Support of every other Science and Manufacture, have heretofore been importing Instruments from such Parts of the World, as they have imagined could best supply them. But from a real Want of an Establishment of this Kind, for the making all Kinds of Instruments for Husbandry, the Importation of useful Ones has not answered the laudable Purposes of the Importers; at least the Instruments have not been so generally introduced, as every Man of generous Sentiments must believe to have been the Intention of the Importers; for when they have been landed, they have been immediately carried to the Neighbourhood of the Importer, and at best, brought into Use only in that particular District; so that if a good Instrument should, by this Means, be introduced in the *North*, the *South* could receive no Benefit from it, and so *vice versa*; from which Cause the general Introduction of good Instruments must have been slow. But when we add the Consideration of an Unwillingness in Mechanics to make from the

I N T R O D U C T I O N.

Patterns so imported, and what is quite as inconvenient, a Want of Men to shew the Use of them, it is not to be wondered at, that Tillage is in no better State in *Ireland*, than it is in many Parts of *England*, where it is, from the same Causes, in as bad a State, I believe, as in any Part of the World ; at least, any Part which pretends to the Practice of Agriculture. From the latter Cause it has too often happened, that Instruments of real Use have been thrown aside, neglected, and abused, until they became unfit for the Use of the most experienced Hand.

It was conceived, that if a Factory were established, for making Implements of Husbandry, it would be a Means of dispersing throughout the Kingdom, Variety of Instruments of the best in their Kinds ; but that alone would not have done, if the Maker had not a competent Judgment in the Use of them, and a Notion of constructing such new ones as have been wanting, and improving such as have been defective. How far I have answered that Expectation of my Patrons, I shall submit to the candid Consideration and Experience of the Public.

Many Persons have, heretofore, made and executed a single Machine of particular Construction, and that with Success to themselves and the Publick. But I believe, I am the only Person, who has ever attempted, to execute Machines, for every Branch of Agriculture, or that can be useful in the Business and Pleasure of a Country Life.

How far this Attempt has been attended with Success, I shall not presume to describe ; but appeal to the Approbation of the Publick, in their Use of the Machines, and the Demand I have had ; for in about two Years, I have sold to the Amount of one thousand six hundred Pounds worth of them.

How far the Publick must be benefited, by such a Variety of Models, in their full Proportion, being dispersed over the Kingdom, from which others are daily making,

making, without the Trouble of calculating their Scantling and Iron Work from Scales (for which the common Run of Workmen are by no Means qualified) I submit, to the Consideration of the Candid.

Reflecting, upon what must be the Sentiments of such; I feel some Consolation, amidst the Care, Application, Anxiety, constant Exercise of Mind, great Expence, and the severe Consequences of the Misfortune I sustained, in the Prosecution of this Undertaking; hitherto, without any Benefit, to myself or Family.

For I can truly say, that I have ever been much more ambitious, of acquitting myself, to the Satisfaction of the Publick, thereby to reflect Honor to my Patrons, than I have thought of Emolument to myself.

An Enthusiasm, perhaps, not sufficiently tempered with Prudence.

However, at that I shall not repine, but whatever may be my Fate, I shall endeavour to Heal the Consequences, with the comfortable Consideration, that I have acted diligently and faithfully, in the Trust committed to my Care.

And I hope I shall be pardoned for believing, that my Factory has already prevented the Importation of many Machines for Agriculture, and put *Ireland* in Possession of several useful Ones, which are to be found in no other Country.

Had this Factory been established in any remote Part, its Effects could not have been diffused through the Kingdom, as I believe, the Demand will shew them to be. Had it been established immediately in the Metropolis, it would likewise have been less effectual, I am willing to believe, than it has been in its present Situation; for this plain Reason, that the
mere

were looking at the best Machines for the Manufacture of Land, could not be sufficiently persuasive of their Importance and Use, unless the Management of them in the Field, or, at least, the Effects of their Operations could be seen. The Situation, being not beyond a Morning's Ride from *Dublin*, gives all People, from every Part of the Kingdom, who are occasionally brought to the Metropolis by other Calls, an Opportunity of examining, not only into the Nature and Quality of the Machines, but the different Methods of Husbandry carried on with them. The Reports of such as have been here, have induced others, not only to come when they happen to be in *Dublin*, but what must be conceived as more grateful to me, to undertake Journeys of more than an hundred Miles, on Purpose to spend some Days with me. It will hardly be necessary for me to say, it could not be from any personal Acquaintance, because it is well known I am a Stranger here; but from a Zeal in the Cause of Agriculture, which, I have the Pleasure to observe, is peculiar to the Gentlemen of *Ireland*.

I must be allowed to say, that I have frequently, since the Commencement of this Undertaking, felt great Concern that it has not been in my Power to give so general a View of the different Machines I make, as I wish to do, to those who come on Purpose to see them: but it will be considered, that as fast as they have been finished, they have been sent away, because the Demand has always exceeded the Possibility of Execution; besides which, I really have not Buildings to keep an Assortment in; a Point which I am exceedingly anxious to obtain, for the speedier Dispatch of the Orders, and the greater Convenience of the Public.

And I hope it will not be looked upon as extraordinary, that I am not equal to the erecting such Buildings as are necessary to the conducting so great a Work as this is now grown, when it shall be considered, that it is very little more than two Years, since the Building which I had erected for a Part of this Under-

Undertaking, my Dwelling-House, Materials, and Part of my Furniture were consumed by Fire. And indeed, were it ever so compatible with my Circumstances, I know not whether it would be altogether so prudent, to lay out a large Sum of Money, for carrying on a Work, in which the Public are much more interested than I can possibly be as an Individual; for I believe it is a well-known Fact, that many Machines which are purchased of me, are intended only as Patterns for others to work by; a Circumstance, which calls for Circumspection and Caution on my Part, in the Opinion of many. These Considerations, added to the unhappy Event of the Fire, *which came upon me by this Undertaking*, had almost persuaded me to decline this Factory; but when I re-considered who were my Patrons, and the Country I was serving, I could not harbour a Doubt, but my Labours and Misfortune would, at the proper Time, obtain the friendly Interposition of *those*, who will consider them candidly and generously. Still animated with these Hopes, I have persevered in the Re-establishment of this Undertaking, at an Expence, and under Difficulties, which Timidity and Diffidence would tremble at.

But although my Instruments and Methods of Husbandry are passing into many Parts of the Kingdom, with a Rapidity, which the greatest Vanity on my Part could not have expected; yet, should I live, to be by any Means enabled to carry my Undertakings for the general Improvement of Agriculture in *Ireland*, to that Extent, which, what I have done, assures me is infinitely wanting, I do flatter myself, that a very few Years might be productive of this Kingdom's obtaining the first Character in the Article of Tillage, which will necessarily pave the Way to Perfection in every other useful Art, as the Neglect of it, must, on the contrary, be attended with the most fatal Consequences both to the Affluence and Honor of the Nation. But I shall defer saying more upon the extending my Plan till another Opportunity.

In

In the Prosecution of this Undertaking, I have been frequently called upon for Leather Harness, and have endeavoured to get it done in the best Manner that the Workmen in that Way could do it, but as I never could get any done to my Mind, or a Workman who knew how to do it, in the best *English* Manner, although I frequently advertised for one, I have often, where I could do it, declined receiving Orders for Leather Harness. But notwithstanding that, the Demand has still increased upon me, insomuch, that I have been obliged to renew my Endeavours to obtain a perfect Workman in that Branch, and have lately got an *Englishman*, who I find upon three Months Trial, is a compleat Workman, in the making all Kinds of *English* Harness for Ploughs, Waggon, Carts, Coaches, &c. and therefore, I have, after examining minutely into the Expence of every Article, added all Kinds of Leather Harness, both elegant and plain to my List of Instruments, which will appear in their proper Place, to be ranged in such a Manner, as I hope will be intelligible to all Persons who may have Occasion for any Thing in that Branch.

I shall now endeavour to give a short Account of the Uses of some of the Instruments named in the following List, every one of which I have numbered, for the more convenient Reference of the Reader.

A short

A short Account of the Uses of the Instruments, referring, by the Numbers, to their Names, and the Description of their Parts in the List of them hereafter given.

MY former Publications have shewn, that the Instruments for the Drill Husbandry are calculated only for that particular Species of Culture; and therefore I shall take no other Notice of their Uses in this Place, than just to say, that for the Information of those who may adopt that particular Husbandry, I have ranged the necessary Instruments together, that they may appear at one View, under the Heads, N^o. 1, 2, 3, 4, 5, 6, and 7, in the List.

N^o. 7. Contains an Account of the necessary Harnesses for the using these Instruments, the Bulk of which it is to be presumed, most People have; those who have them not, will please to order them with the Machines, otherwise they will not be sent.

N^o. 8. Is a Drill Plough, to which I have given a Place in my List, because I have met with some Persons who have conceived an high Opinion of that Species of Husbandry, for which that Plough is calculated. My Sentiments upon *that Practice* of the Drill Culture will be found in my Report for the Year 1766; Page 38.

N^o. 9. Is a Plough which has been found to answer all the Purposes of the breaking and manufacturing Fallow of any Kind; the Draft has been found easy to the Cattle, and the Plough, from the Manner in which it is fortified with Iron in every Part subject to Distress, is rendered irresistible, save, that the Coulter, Sock, and Ground-Plates, from the constant Friction in the Soil, must wear, and therefore will sometimes want repairing. What recommends this Plough very much to the Practice of the common

B Plough-

The Description of the Uses of the

Ploughman is, that it approaches the Plough he has been used to, more than any other I make, except the Chip-Plough, N^o. 10, which I cannot recommend the Use of to any Man, because the Chip is never large enough to take a Share with a large Socket, by which Means all Chip-Ploughs are apt to break off behind the Sock or Share ; whereas, my Socks are made large in the Socket, and are always put upon the Point of the Crofs.

The Plough, N^o. 11. is calculated for throwing up the last Sod, in sowing Wheat under the Plough in small Ridges, in order to bring the Furrows narrow in the Bottom ; and which I believe answers the Purpose very well, though I have not used it myself, for Reasons which will appear presently. See No. 15, in the Lift.

N^o. 12. Is a Plough for the Purpose of skinning Ground for Burning ; and I have the Pleasure to understand, that this Plough has compleatly answered the Purpose to those who have used it. I shall just be allowed to say, that the Burning some Kind of Land is undoubtedly a very good Practice, upon its first Improvement ; but in other Cases it is altogether as bad a Practice as can be introduced. See my Hints upon Husbandry, published by Mr. Flinn in *Castle-street*.

N^o. 13. Is a Plough calculated for two Horses, said by some People to be capable of the first breaking, and compleatly manufacturing any Ground for Fallow. I must dissent from that Opinion, because I am sure there is much more Land which two Horses cannot effectually break, than there is which they can. To support this Opinion, of two Cattle being sufficient to break Land in general, shallow plowing is recommended as a general Practice, a Practice so contrary to all Principles, that it is hardly worth answering. But let any Man *carefully* examine the Roots of the Plants which are in the Farmers Department, and he will find, that they pass a great Way into the Soil, if the

the Tiller will, by proper Tillage, allow them to do so ; but if he will only just skin the Surface, particularly in a strong Soil, he must not expect the Roots of small annual Plants to penetrate in Search of Food, where he has not introduced his Coulter and Share to a proper Depth ; and with the Strength of two Horses he cannot ; though I defy any Man to hurt this Plough, as I make it, with four, by fair Work. But if, from a Plan of Oeconomy, the Farmer wishes to introduce this Plough, he certainly may do it to Advantage, after he has deeply broken his Fallow, and well reduced it by the Harrow, provided he does not let it remain too long to consolidate. And if, by this Saving, he can be prevailed upon to add one more ploughing than usual, he will undoubtedly find his Account in the Use of these Ploughs in the manufaturing his Land ; but 'till he can be dispossessed of the inconsistent Notion of its being possible to make his Land *too fine*, I fear we shall not introduce the Extra-ploughing. The established Method of not exceeding four Times ploughing Fallow, is founded in Ignorance ; every Fallow should be ploughed, until it is well reduced to receive the Seed.

N^o. 14. Is the Lomax-Plough for four Cattle, to draw double, and is such a one as Practice has induced many People to approve, I having sold many of them ; but every common Ploughman does not like them so well as they do the one I mentioned before, N^o. 9, neither are they, indeed, so fit for *stony* Land, as that, but in every other Respect, answer all the Purposes of compleatly working Fallow.

N^o. 15. Is the Plough which I have called, in my Report for the Year 1766, p. 40, the *Seeding* Plough ; in the Use of which the Farmer will find many Advantages : But I shall say no more in the Recommendation of it, than to refer him to the Report already mentioned, and leave his Experience to examine the Merit of the Instrument, in the sowing Corn under the Plough. I before said, when I was speaking of the Hunting-Plough, N^o. 11, that for Reasons which

The Description of the Uses of the

would appear presently, I never had used that Plough ; which are, that I find this Plough answers all the Purposes of *that* and the four Horfe Ploughs, which are used for the *sowing* or rather *burying* Wheat. Some indeed, who pay Attention to their Tillage, have very properly had two of these seeding Ploughs, which, with one four Horfe Plough, I call a Set of Ploughs for the common Husbandry. The two small Ones are the one wider and the other narrower in the Sole : The latter of which always follows the wider one, and clears up the Huntings, by which the Work goes on mathematically ; whereas, it would be inconsistent, in finishing the Ridges, to have the wider Plough following the narrower. A Point not sufficiently attended to in the general Construction and Use of Ploughs.

Nº. 16. Is a Plough of the same Kind, to be worked with only one Horfe, either in the Field or Garden, which I think may very advantageously be introduced in the Field for sowing Corn under the Plough in broad Ridges, provided the Land be first *well manufactured*.

Nº. 17. Is a large strong Plough, calculated, at the particular Request of some Gentlemen, for the ploughing very deep, by a great Strength of Cattle, and those who have had them, have been kind enough to inform me they answer compleatly. Unhappily for me, I cannot use them in my Soil, the Quarry being too near the Surface.

Nº. 18. Is a Plough which is calculated for keeping Land flat in its Tillage ; I presume first introduced on very dry Land, the better to retain Moisture, in which, I have no Doubt, but that it may answer ; and it has also been introduced for the Purpose of laying Land flat, which is intended for Lawns and Meadows. I shall not enter into the Merits of this Instrument, further than to say, that I have endeavoured to divest it of the Wheels, by which to render it a
cheaper

cheaper and less complicated Machine, than it can be when worked with a Carriage.

N^o. 19. Is a Plough, which Mr. *Tull* sensibly calculated for the speedier Reducement of Ground ; but the Draft of it is no less heavy than its Expence ; and at the Time he invented this Plough, the Scarificator, N^o. 27, had not been thought of. But as we are now in Possession of that Machine, which will so effectually cut the Ground into Slips or Strings of three Inches broad, that by preceding the four Horse Ploughs, N^o. 9 or N^o. 14, a little while before the Ploughs begin to turn the Land, all the Purposes of Mr. *Tull*'s four-coultered Plough will be answered.

N^o. 20, and 21. Are Wheel-Ploughs, which, from my Observations upon their Operations, I conceive cannot be so effectual in general Use, as Ploughs without Wheels, for this plain Reason, that as the Wheels are the Gauge for the Depth of the Plough, wherever they meet with any Thing which raises them, the Plough consequently rises so as to work shallow, and sometimes not to touch the Surface ; at other Times, when the Wheels sink into any Declivity, the Plough immediately sinks in Proportion, so that the *Ploughing* is rendered irregular by those Kind of Accidents, and will continue to be so until the Ploughs have been at Work upon the same Land for some Years. Another Consideration against them is, that they are in general complicated, and not a little expensive.

N^o. 22, 23. 36, 37, and 41, are Sledges and Truckles for various Purposes. I shall only just add, that I wish it were more generally the Practice, to introduce Sledges for removing our Ploughs and Harrows from Field to Field than it is ; for by the too general Manner of removing them, they often receive more Injury than by a Month's Work ; besides which, the Cattle are too often hurt.

The Description of the Uses of the

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N^o. 26. Is an Instrument, calculated for the Purpose of marking out Drains with strait Edges, in order to save the Expence of that Part of the Work being done by a Spade and Line, which is attended with Delay ; and the Machine is so constructed, that the Drain may be marked out from sixteen Inches to two Feet wide, at Discretion. Where large Quantities of this Kind of Work is to be done, the Machine will save considerable Expence ; but where the Quantity of Work is but small, it will be an unnecessary Purchase.

N^o. 27. Is the Scarificator mentioned before, when I was speaking of Mr. *Tull's* four-coultered Plough, to which it will be a very useful Substitute : and as to its other Purposes, I refer the Reader to what I have said of it, in my Report for the Year 1765, Page 41, &c.

N^o. 28. Is an Instrument which I built upon the two preceding ones, in order to lessen the Expence to those who may have Occasion for them both, and which I have the Pleasure to observe, operates completely in either Case.

N^o. 29. Is calculated for sinking Ditches by the Strength of Horses, after they are laid out, in order to save *Spade Work* ; but after the Ditch shall be sunk, the Sides, it will be imagined, must be dressed by the Spade. This Plough has also been found very useful in sinking Potatoe Furrows, which saves the Labour of the second Spitting, and reduces the Soil at once to the Command of the Shovel. It has also been found useful in deepening the Furrows, for the second covering of the Corn by the Shovel.

N^o. 31 to N^o. 40, both inclusive, are Harrows of different Kinds ; Instruments so universally known, that I need not say more of their Use, than just to observe, that the Harrow, in general Use in this Kingdom, is too often ineffectual in its Operation, by its being

being made only in *one* Frame; but by mine being made in two Frames, united together by what I call coupling Bolts, they lie close to the Ground, * even in irregular Places, and therefore, I flatter myself, fulfil the Purpose of the Machine, namely, harrowing; whereas, the Harrow which is made with one Frame rides all rising Places in the Field, and consequently passes over hollow Places very frequently. The triangular Plough-Harrow, No. 32, is indeed an Exception to this Observation, because it consists of only one Frame; but then this Instrument is made in a particular Manner in the Pins, to *bite* the Ground, (if I may be allowed the Expression) because the Operation of it is diametrically opposite to that of the common Purpose of Harrows; for this Instrument acts like a Miner, under the Surface, the others act above it. And, indeed, the very *Name* which I have given this Instrument seems to indicate, that it is to act somewhat like a Plough, as well as an Harrow. This Instrument is wonderfully powerful in reducing Ground, clearing Weeds, Stubble, &c. and is really easier in its Drift, than would be imagined by looking at it.

No. 42 to 53, both inclusive, are Waggon and Carts of different Kinds. Were I to enter into a general Description of their Construction, it would swell this Paper greatly beyond the Bulk of what I intended; and therefore I shall only beg Leave to inform the Reader, that I have given very particular Attention to the Improvement of this Kind of Carriages; and I have the Pleasure to think, that the Demand I have for them, is as strong an Indication as I can have, that in the Judgment of others, I have not been unsuccessful in that Attempt.

* I have an Harrow for reducing Ground, of quite a new Construction now in Hands, and before my next Publication, shall try it; and if it answers my Expectations I shall give it a Place in my next List.

Some Considerations upon the Construction of the Two Sorts of CARS in general Use, throughout this Kingdom; with a Description of One of a new Construction, N^o. 54. and 55, calculated to carry greater Burthens, and with much more Ease and Safety to that generous Creature, the Horse.

The Low-
ness of the
Wheels of
an Outside
and Inside
Car.

THE Advantage which is apprehended to be gained by the Lowness of the Wheels of common Cars, is said to arise, from the Weight of the Load, pressing them forward. And yet, I have generally observed, that the *greater* Weight of the Load is put on *before* the Wheels, and that *entirely* in loading Stones. Hence it should seem, that if the Weight of the Load, does at all contribute to the Motion of the Wheels, instead of its contributing to their Motion *forward*, it must on the contrary, press them *backwards*. And the *lower* the Horse, the *greater* will be *that Effect*. But to be mathematically full upon this Head, would require more Room, than the intended Bulk of these Considerations will admit of.

The Friction upon the Gudgeons of an Outside Car.

The Gudgeons are in Contact with the Bolsters, which are always *Wood*, and therefore the Friction must be more laborious to Cattle, than when in Contact with Metal or Brass. Besides, the Bolsters are generally about four Inches broad, and therefore bear four Inches upon each Gudgeon, which must still cause a greater Resistance, by an *Increase* of Friction. Whereas a small Spoke Wheel, when *properly hung*, will not have a Friction of more than an Inch and an half, and that will be lessened by its being Steel against Metal or Brass.

Inside Cars
their Friction.

The inside Car is yet a more laborious Carriage to Cattle, because the Friction in that is between *Wood* and *Wood*, which is in Contact *eight* and *ten* Inches. The Axis is of Timber made round; and the Sides of the Car are laid upon that. To prevent the Axis wearing

wearing in the Place of Friction, it is often stuck with Nails. I have lately seen a few Instances, where the Axis has been covered, in the Place of Friction, with Cast Mettle, which is an Amendment.

Both the Carriages of this Kind, and which are the common ones of *Ireland*, have their Wheels made of Plank, commonly called *Block Wheels*. Through these Wheels pass the Axis, which is of Wood, and generally about four Inches *square*. The Wheels have a *square Mortice* made through them to receive the Axis upon which they are *firmly wedged*. Wheels, how made, and how fixed upon the Axis.

The Consequence is, that the Axis must always turn *with* the Wheels: And one Wheel cannot turn *independant of the other*. Hence follows infinite Distress to Cattle. Consequences.

For when the Carriage is to turn short, as soon as the Point on which the Horse presses at his Shoulder, forms an acute Angle with the Wheels, the Wheels *cease to turn*, for they immediately drag. The Horse is obliged to exert *all* the Power he has against this Resistance; which in *this* Operation is *Sideways*, and therefore he is deprived of at least half his Power, in the very moment, in which he wants an Exertion of the greatest he has, to conquer the natural Obstruction of the Machine. But if Straw, stiff Dirt, or a Stone, meet the Wheel which *should go forward*, the Horse actually stops, and cannot move the Carriage, till the accidental Obstruction be removed.

And this Effect arises, in turning *either* of the Carriages named. The Body of the Carriage is frequently racked and broken, and the Horse often falls.

The Block Wheels in deep Roads, collect and carry with them great Quantities of Clay, which very soon come in Contact with the Car Sides and Inside Back, by which the Horse is infinitely distressed, and at last will be obliged to stop, unless an unmerciful and giddy Driver force him on, until he falls by Drawing,

Drawing. Careful Drivers are much interrupted in their Journeys, by removing these Obstructions, which frequently require a good Deal of Labour.

In drawing Hay Home, the outside Cars are often stopped by a Collection of Hay between the Wheels, Sides, and Gudgeons, which take so much Time to remove, that I have often had Delay, Irregularity and Interruption ensue, in the drawing Home Hay, and which the Farmer must often have experienced.

Another
Cause of
Friction.

The Ends of the Axis to an outside Car, come so nearly in contact with the Sides, that there is a continual Friction between them. In turning the Carriage, the Ends of the Axis immediately lock firm against the Sides. All tending to the Distress of the Horse.

A short Description of the NEW CAR.

The new
Car.

Having thus shewn the Inconveniencies which attend the Construction of the common Cars, I shall now shew how far I have endeavoured to remove them, in the Construction of the Cars, named in the following List, N^o 54 and 55.

Why the
Form of the
common Car
was adhered
to as much
as could be.

I apprehended a Carriage which adhered, as closely as might be, to those in common Use, would be most likely to make its Way into general Use.

Friction,
why less in
this Carriage
than a com-
mon Car.

First, as to the Objection made to the Friction in the common Cars, I have endeavoured to lessen that in this Carriage, by Iron Arms, steeled; running in Metal Boxes, touching in each Wheel, only about an Inch and an Half.

The one being *Steel*, and the other *Metal*; both hard Bodies; it is apprehended the Friction must be considerably less than in a common Car; and consequently the Resistance lessened at equal Weights.

Why Brass
Boxes were
not chosen.

Brass Boxes would have been chosen, were it not, that it is apprehended they would be too dear for the lower People.

The

The Height of the Wheels exceed those of a common Car only about six Inches: But notwithstanding that, the Body of the Carriage is raised, by the Manner of hanging the Wheels, which will appear in the Machine. The Reason for which is, to bring the Shafts as near upon a strait Line as may be, to the Point of Draft in the Horses Shoulder; whereas, in the common Cars, the Points of the Shafts (commonly called the Sides) are so high, caused by the Lowness of the Wheels, that when the Draft is from the Points of the Shafts, the Shafts, and Point of Draft in the Shoulder of the Horse, form an obtuse Angle, by which the Horse is drawing upon his Back, greatly to his own Distress. To remove this Inconvenience, some have a Chain running as far back, under the Shaft from the Collar, as brings the Draft upon a direct Line. But this is liable to two capital Objections, particularly in the common Cars. Because in the Action of turning the Carriage, the Shaft from which the Beast draws, is a Lever to him, and by so much as he loses of its Length, in Proportion he is deprived of the Use of it, as a Lever. And every Man knows that the Ease of a Purchase, depends upon the Length of the Lever. The other Objection is, that when the Carriage inclines to fall backwards, which is too often the Case, the Horse cannot prevent it so effectually by his Draft's being so far back upon the Shafts, as he can when his Draft is from the Points, upon the same Principles, that his Lever is considerably shorter, than when he draws from the Points of the Shafts. But in this Case, the Purchase is perpendicular; whereas in the former it is horizontal.

As to the Inconvenience, which attends the common Car Wheels not turning properly; in this I have totally removed it, by using Spok Wheels, which are to turn upon the Axis, independent of each other; but the Axis is not to turn, as in a common Car.

Wheels turn independent of each other. And why Spok Wheels are chosen.

Another Reason for choosing Spok Wheels is, that they are by no Means so liable to collect Clay or Dirt in their Passage, as the Block Wheels to a common Car,

Further Reason why Spok Wheels are chosen.

In common
Practice,
Wheels
hung improp-
erly.

And why.

Car, and therefore less liable to the Obstructions caused thereby; unless when they are improperly hung, which I am sorry to observe is too prevailing in this Kingdom, and even in *England*, as may be explained to such Persons as shall wish to understand it; as may also, the Manner of clouting a wooden Arm, or making an Iron one to most Advantage, which as much as possible, is kept a Secret in the wheeling Business; for there are many Men of that Trade who can make a good Wheel, and yet know not how to bush and hang it. Upon which *totally* depends the easy Draft of a Carriage.

Best Manner
of bushing a
Wheel.

To bush a Wheel in the best Manner, and most expeditiously should be done with an Engine, calculated for that Purpose only.

Block
Wheels
cannot be
effectually
bushed.

Block Wheels cannot be bushed properly, as Experience has often proved; for there are Gentlemen of Ingenuity in this Kingdom, who have seen the great Inconvenience attendant on the Operation of the common Car, and have attempted to remove it, by putting Boxes in Block Wheels, in order that they might turn independent of each other, upon Iron Arms; but it has been found, that great Difficulty attended the fixing the Boxes, because, if put really into the Plank, they cannot be wedged, it being impossible to drive the Wedges across the Grain of the Plank. To remove that Difficulty, a Piece of Timber has been lodged in the Centre of the Wheel, placing the Grain of the Block horizontally, and thereby the Boxes could be firmly fixed in that Piece: But the Remedy was almost as bad as the Disease; for the Block, or Piece of Timber, which is so lodged in the Centre of the Wheel, soon became loose by Labour and Contradiction, and consequently that Part of the Carriage must fall into a crazy Fabrick; abstracted from Labour being increased to the Horse, as soon as the Wheels, in their revolutions, form that offensive Sight, zigzag Lines, which is the unavoidable Consequence of being out of Square, be the Wheels what Kind they may.

In

In the Article of putting on the Tire, I flatter myself some Amendment is also made, and which I now pursue in all the Carriages made in my Factory. Manner of putting on Tire improved.

In the common Manner of putting Tire on Wheels, the Nails are apt to start, and the Heads break off, by either of which Accidents the Tire gets loose, and the Wheel is suddenly racked or shaken. To prevent this, I put every Strake on with Screw-bolts, which draws up the Tire, and keeps it to its Place, from which it never can start, till the Tire be worn out.

The Manner of making the Heads of the Bolts, and punching the Tire, I apprehend, would be a great Preservation of our Roads, were it in general Use. And therefore seems to merit the Attention of the Legislature; for by the general Manner of making the Nails for Tire, the Law for the Establishment of broad Wheels is defeated. Roads how to be preserved by the Manner of making Tire-Nails.

To prevent any Dirt or Grit getting in between the Boxes and Arms of the Carriage, Sand-pans are put upon the Ends of the Stocks, and Cuttoos over them, which will appear upon View, and which are put upon all the Carriages made in my Factory. The Iron Brackets which are mentioned, as being added to this Carriage, N^o. 50, in the following List, are disposed in such Manner, as to fortify the Parts most liable to fail in a Car; the Shafts or Sides are plated with Iron from the Axis to the Tug-pin Holes, and in every Part firmly affixed with Screw-bolts, which renders this Carriage a Machine of almost irresistible Strength and Permanence. Dirt and Grit, how prevented getting into the Boxes.

I might have been much fuller in my Description of this Car, but the Demand I have had for them is a stronger Proof, than any other I can give, of their superior Convenience, in every Kind of Business, in which a Car can be used; and therefore I shall only add, that one Horse has drawn, at one Load, upwards of 26 Hundred Weight upon one of them on a very rough Road; and I am well persuaded, that the same Horse can draw upwards of 30 Hundred on the same Car-

The Description of the Uses of the

Carriage without any great Distress ; and what seems to be a pretty strong Fact, is, that since I introduced these Cars, my People will not use the old ones, and therefore, I have been obliged to part with all the common Ones I had.

And it is allowed by competent Judges, that they are compleatly calculated not only for the Use of the Farmer, but for Sumpter Carriages on Circuits, military Baggage, Linen Cloth, Carriers, Millers, Timber, and Luggage of all Kinds ; because severe Trials in the Use of them have shewn, that a Horse travels with Pleasure under a Load from 12 to 20 Hundred Weight upon one of them, when, on the same Journey, an Horse, under a common Car, with 6 and 7 Hundred upon him, has been suffering exceedingly by his distressing Draft, of which we have had many Instances, and very remarkable ones in bad Roads.

It must be confessed, that the Price is higher in the *first* Purchase than a common Car ; but yet, when it is considered that this will last much longer, and that the same Horse which draws 5 Hundred on a common Car, will, with more Ease, draw 12 Hundred on this, Candour must admit it to be a much cheaper Carriage, for all the Purposes of Business and Profit. And all Men will allow, that no *perfect* Machine can be had at the Price of an *imperfect* one.

For the Convenience of such Persons as use Turf in their Houses, I have lately put a Cradle to this Carriage, to be put on and taken off occasionally, (see N^o. 57) by which it is said, by those who are acquainted with Turf, that as much may be drawn at one Load, as at three or four, in the common Manner.

N^o 58 to 87, both inclusive, contain a List of various Articles, which, from their Names, shew their Uses, altho' some of them are new ; those which are improved in their Construction will shew for themselves.

N^o. 88. Is an House and Boxes, calculated for the Preservation of Bees, by which large Quantities of Honey and Wax, it is said, may be taken, without murdering those laborious Insects. I have, in some of my former Papers, professed not to understand the Treatment of Bees; but from an Attention which the DUBLIN SOCIETY have lately given to their Preservation, I was animated into an Application towards the Management of them, and have received great Information in reading Mr. *Moses Rusden's* Treatise upon that Subject, and from whose Book I have built one of these Houses, &c. described, N^o. 88. The Pleasure I have received, in seeing their Industry and Mechanism, which this Manner of keeping them admits of, I have conceived to be a full Recompence for the Expence of building their little Habitation, and the Success which the Method promises, induced me to give it a Place in my List. The Edition which I have of Mr. *Rusden's* further Discovery of Bees was printed in the Year 1679; whether it has gone through many Editions I know not, but I fear it is now out of Print, which being, I think such Gentlemen as are reputed Judges of this Management of Bees, would do the Public a Service to recommend the re-printing this Book.

N^o. 89. Is a neat and convenient Kind of Crib, for the more commodiously foddering black Cattle without Waste of their Fodder, calculated more as a Pattern for Gentlemen and Farmers to build them by, than with any Expectation of selling them, they being too large to be carried to any great Distance, but may very conveniently be removed from Place to Place about a Farm.

N^o. 90. Is a Machine, calculated for the slicing Turneps for black Cattle with Expedition. An Instrument which I was induced to bend my Attention to the Construction of, from observing that the Society of Arts in *London* had offered a Premium for the Construction of such a Machine. In that which I have made for the Purpose, it is conceived by competent Judges, that I have not been unsuccessful, because the

A L I S T of the

the Machine is fortified by great Strength, at the same Time that it has powerful Execution. The Simplicity of its Construction will render it intelligible to any Man, immediately upon a View of it. The Reasons why it is prudent to slice Turnips for black Cattle, will be found in my Report for the Year 1764.

I continue to give this Instrument a Place in my List, but from the Method which I have lately pursued, in feeding my Cattle with Turneps in the Winter, I have, in a Manner, rendered this Machine rather unnecessary, of which I shall furnish the Publick with Information in my next Report, for the Year 1768.

Nº 91 and 92, are sufficiently described in their respective Places.

A L I S T of the INSTRUMENTS.

Nº. 1. **T**HE DRILL PLOUGH, upon an improved Construction, with Brass Boxes, and compleatly mounted with Swingle-trees, Straps, Turnip-box, and Standards; and for sowing Wheat, Barley, Bere, Oats, Peas, Beans, Turnips, Sainfoin, Burnet, Buck-wheat, &c. 8 Guineas. See p. 9.

Nº. 2. The DRILL HARROWS, of a new Construction, rivetted and mounted with fifty-four Harrow-pins, hung to a Carriage with Chains, Hooks, Keys and screw-bolted Staples. The Carriage mounted with Iron-arms, affixed with Screw-bolts and screwed Staples, Spoke-wheels bound with Iron, a Pair of Shafts, double-twisted Back-band, Staples and Hook, Tug-pins and Chains. 5 Guineas. See p. 9.

Nº. 3. The HOE PLOUGH, compleatly mounted with double Bands, four Iron Wedges, Coulter, Bolts, Keys and Hook, Rider and Screw-bolt, the Mold-board

board, Land-side and Bottom, plated with Iron, Cross and Beam united by a thorough Screw-pin, a steeled Coulter and Iron Share. 40 Shillings. See p. 9.

N^o. 4. The SINGLE CULTIVATOR, mounted in the same Manner, only that this Instrument has no Mold-board, but is made with a Chip which is plated with Iron. 1*l*. 14*s*. 1½. See p. 9.

N^o. 5. The DOUBLE CULTIVATOR, mounted in the same Manner, but instead of a Share with one Fin, this has two, made of wrought Iron and steeled. 40 Shillings. See p. 9.

N. B. The Instruments, N^o. 3, 4, and 5, are for Horse-hoing Drilled Crops, and to work them, requires a single Swingle Tree, and Swivel Chain, and therefore I shall enter it here as N^o. 6. Where any Person shall chuse to have one for each of them, they will please to order them.

N^o. 6. The SINGLE SWINGLE-TREE and SWIVEL CHAIN. 5*s*. 5*d*. This Swingle-tree will answer for any other Plough, which is to be drawn by Cattle lengthways, and which is always to be the Manner in Horse-hoing Drilled Crops.

In my former List I named the Marking Plough, and Double Mold-board Hoe Plough, but I there mentioned them as not being absolutely necessary to the Drill Culture, and in the Continuation of my Practice I am confirmed in that Opinion, and therefore I shall not give them a Place in this List, the above Instruments being all that are necessary for the compleat Execution of the Drill Husbandry, except the Harness, and two Muzzles, which I describe altogether, under the Article N^o. 7, for the Convenience of such Persons as have them not, or who cannot conveniently get them.

C

N^o. 7.

A LIST of the

No. 7. The HARNESS for the Drill Husbandry, described under one Head, with the Prices of each Article. When Gentlemen order them, they will please to distinguish, whether they would have those under the Column A, B, or C, by naming the Letter, there being a Difference in the Price, and consequently in the Quality.

A.				B.				C.			
No.	l.	s.	d.	No.	l.	s.	d.	No.	l.	s.	d.
Three Bridles, —	107	at 0	11 4½	108	at 0	8 0	109	at 0	6 0	6 0	6 0
Three Neck Collars, —	115	0	11 4½	116	0	7 6	120	0	4 6	4 6	4 6
One Cart Saddle and Crupper, —	133	0	17 4	134	0	11 4½	135	0	7 6	7 6	6 6
Two Back-Bands and Pads, —	148	0	8 8	—	0	8 8	149	0	6 6	6 6	6 6
Two Belly-Bands, —	143	0	3 3	—	0	2 2	—	0	2 2	2 2	2 2
Two Back Cruppers and Hip Straps, —	156	0	7 7	—	0	7 7	—	0	0 0	0 0	0 0
Two Muzzles, —	167	0	4 4	—	0	4 4	—	0	4 4	4 4	4 4
Two Pair of Trace Pipes, —	157	0	5 5	158	0	3 6	159	0	2 8½	2 8½	2 8½
Three Hame Straps, —	165	0	4 4	—	0	4 6	—	0	0 4	0 4	0 4
Two Pair of Collar Hames, —	99	0	6 6	—	0	6 6	—	0	6 6	6 6	6 6
One Pair of Draft Hames, —	99	0	8 1½	—	0	8 1½	—	0	8 1½	8 1½	8 1½
Two Pair of Long Traces, —	97	0	11 4½	—	0	11 4½	—	0	11 4½	11 4½	11 4½
One Stretcher, —	96	0	2 2	—	0	2 2	—	0	2 2	2 2	2 2

No. 8. The DRILL PLOUGH of a new Construction, for sowing Drilled Crops in the Flat Way at equal distant Rows. 6 Guineas.

N. B. I would not be understood to recommend this Instrument, because I conceive but an indifferent Opinion of the Husbandry. But as others may form another Opinion, I give a Place to the Instrument in my List. See p. 9. No. 8.

No. 9. The BLOCK PLOUGH improved, for four Cattle to draw double, compleatly mounted with Beam-plates and Screw-bolts, Mold-board, Side and Bottom plated with Iron; the Beam and Crofs united by a thorough Screw-pin, double Bands and Iron Wedges, Rider and Screw-bolt, a screw Staple, Hook and Wafhes, Collar, Bolts, Keys and Hook; a strong steeled Coulter and an Iron Share of a new Pattern. 2*l.* 10*s.* For its Use, see p. 9. No. 9.

No. 10. The CHIP PLOUGH, mounted in the same Manner. 2*l.* 10*s.* See p. 10. No. 9.

No. 11. The HUNTING PLOUGH, with an Iron Chip, the Cattle to draw single, mounted in the same Manner. 2*l.* 10*s.* See p. 10. No. 11.

No. 12. The BAITING PLOUGH, mounted in the same Manner, with a wrought Iron steeled Share. 2 Guineas and an half. See p. 10. No. 12.

No 13. The ESSEX PLOUGH, *i. e.* a Plough to work with two Cattle, both a-breast, and the Ploughman to drive, mounted in the same Manner. 2 Guineas. See p. 10. No. 13.

No. 14. The LOMAX PLOUGH, for four Cattle to draw double, mounted in the same Manner. 2*l.* 10*s.* See p. 11. No. 14.

No. 15. The LOMAX PLOUGH, for two Cattle to draw single, mounted in the same Manner. 2 Guineas. This is what I call my Seeding Plough. See p. 11. No. 15.

N. B. The Swingle Tree, No. 6, is necessary to work this Plough.

No. 16. The GARDEN PLOUGH, mounted in the same Manner as No. 3. 1*l.* 14*s.* 1½. This is a Plough of the same Make, calculated for one Horse. See p. 12. No. 16.

N. B. No. 6, is necessary to work this Plough.

No. 17. A large strong Plough, mounted in the same Manner as No. 9. and of the same Make, calculated for ploughing from twelve to eighteen Inches deep, and to be drawn by any Number of Cattle from eight to sixteen. 3 Guineas. See p. 12. No. 17.

No. 18. The TURN-WRIST, or Kentish Plough with or without Wheels. See p. 12. No. 18. The latter 3 Guineas.

No. 19. Mr. TULL's Four Coultered Plough. See p. 13. No. 19.

No. 20. The HERTFORD-SHIRE, or double Wheel Plough. See p. 13. No. 20.

No. 21. The OXFORD-SHIRE, or single Wheel Plough. See p. 13. No. 20.

No. 22. SLEDGES for four-horse Ploughs, shod with Iron. 10*s.* See p. 13 No. 22.

No. 23. SLEDGES for two-horse Ploughs, shod with Iron. 7*s.* See p. 13. No. 22.

No. 24.

No. 24. PLOUGH HAMMERS. 3*s.* 9*d.*½.

No. 25. PLOUGH PADDLES. 1*s.* 7½.

No. 26. The DRAIN PLOUGH, to mark out Drains of different Diameters, mounted with a Spoak-wheel, bound with Iron, Iron Axis, double Wheels behind, plated Sliders, Swivels, Staple, Bolt Key and Lip; twelve strong Plates bedded in the Beams, Body Screw-bolts, Brackets and Screw-bolts, thorough Screw-bolts to hind Axis, two strong steeled Coulters and Iron Wedges, with Swingle-trees and Chain, mounted. 5 Guineas. See p. 14. No. 26.

No. 27. The SCARIFICATOR, with four Coulters, for taking Moss off Meadow Land, and otherwise improving it, mounted with a Spoak-wheel bound with Iron, double Wheels behind, two Iron Axletrees, double Iron Brackets, plated Sliders, swivel Staple, swingle-tree Brogues and Loops, five steeled Coulters, their Holes double plated and the Table-screw bolted. 4 Guineas. See p. 14. No. 27.

No. 28. The SCARIFICATOR DRAIN PLOUGH, being a Scarificator and Drain Plough comprized in the same Instrument, mounted with Body-bolts, Brackets and Screw-bolts, a Spoak-wheel bound with Iron, and an Iron Axis, two hind Wheels, thorough Screw Bolts and Brackets to the hind Axis, plated Sliders, swivel Staple, Bolt, Key and Lip; twenty-two strong Plates bedded in the Beams; two strong steeled Coulters for marking out Drains, and seven steeled Coulters for the Purpose of Scarifying Meadow Land; Wedges, Swingle-trees, Swivel Chain, Brogues, Loops, &c. 6 Guineas. See p. 14. No. 28.

No. 29. The DITCHING PLOUGH. This Instrument is mounted in the same Manner as No. 4, with the Addition of Beam-plates, and is an Instrument of the same Kind, only that it is much stronger. 4*os.* See p. 14. No. 29.

N. B. This Instrument is to be worked with the Horses one before the other, and therefore requires a single Swingle-tree, No. 6, and which is to be ordered, if required with it.

No. 30. SWINGLE-TREES which are for drawing double, and a Swivel Chain, Brogues, Loops and Rivets. 12s. and without a Chain, 9s. a Set.

No. 31. A LARGE HARROW upon Wheels, a new Instrument. See p. 14. No. 31.

No. 32. HARROWS for two, and four Horses, with Chains, and affixed to a Carriage, with a Pair of Wheels and Shafts. See p. 14. No. 31.

No. 33. The TRIANGULAR PLOUGH-HARROW, for the reducing Ground; strong Bulls, Iron-slats affixed with Screw-bolts, Anchor-pins, steeled, nitted and screwed; Collar-bolts, Keys and Hook. 5 Guineas. See p. 14. No. 31.

No. 34. DOUBLE HARROWS for four Horses, eight Bulls mounted with square Pins, coupling Screw-bolts and Nuts, screwed Staple and Hook. 3 Guineas. See p. 14. No. 31.

N. B. I have lately rivitted the Bulls of some of these Harrows, on each Side of every Pin Hole, which prevents their being split, in driving the Pins by a careless Hand. That additional Work, adds to the Price 8s. 4d. and therefore, Gentlemen who order them, will please to specify whether they would have them rivitted or not.

No. 35. DOUBLE HARROWS for two Horses, mounted in the same Manner. 3l. See p. 14. No. 31.

N. B. When rivitted, that adds to the Price, 6s. 8d.

No.

No. 36. The SLEDGE for the four-horse Harrows, shod with Iron, Chains, Hooks, suspending Hooks and Staples, and Iron Lid to the Box for the coupling Pins of the Harrows and Keys. 16*s*. 3*d*. See p. 13. No. 22.

No. 37. The SLEDGE for the two-horse Harrows, mounted in the same Manner. 14*s*. See p. 13. No. 22.

No. 38. The TRIANGULAR PLOUGH HARROW, for one or two Horses, chiefly for Peas.

No. 39. GARDEN HAND HARROWS.

No. 40. FLAX HARROWS.

No. 41. SLEDGES and TRUCKLES of every Construction, for Ploughs, Harrows, Bushes, Timber, Sacks of Corn, Lead, &c. See p. 13. No. 22, &c.

No. 42. WAGGONS with either broad or narrow Wheels, finished in the compleatest Manner. See p. 15. No. 42.

No. 43. CARTS with three Wheels three Inches broad, for one or two Horses; with a framed Bottom, Compass Shaft Slats and Screw Bolts, and compleatly mounted with strong Stock-bands, Sand-pans, Buttons and Pins, Cuttoos affixed with Screw-bolts, strong counter-sunk Hinges and Screw-bolts, and strong Shaft-straps; strong Iron Standards, screwed and nutted; Iron Tail-pins and Chains; Iron Tail-board Lips and Bolts; Tuck-pins, Chains and Staples, double-twisted swivel Back-band, Staples and Hook; a strong Iron-sword, Screw-bolt and Staple; strong Hurters, Iron Trap-bolt, Staples and Screw-shaft Staples, strong and full sized Tire on the Wheels, countersunk and put on with Screw-bolts; Fore-carriage mounted with strong treble Iron-bows, Screw-bolts, Centre-pin and Keys, Gudgeons, Gudgeon-hurters and Gudgeon-brackets, affixed with Screw-bolts and strong Shaft-bolt, &c. 11 Guineas. See p. 15. No. 42.

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No. 44.

No. 44. The same CARRIAGE, mounted with Iron Arms, affixed with Screw-bolts and Screw-staples. 12 Guineas. See p. 15. No. 42.

No. 45. The same CARRIAGE, with six-Inch Wheel, Wooden Axle-tree. 13 Guineas. With Iron Arms, 14 Guineas. See p. 15. No. 42.

No. 46. The same CARRIAGE with nine-inch Wheels, Wooden Axle-tree. 15 Guineas. With Iron Arms, 16 Guineas.

N.B. Where the Tire for these Wheels shall be chosen of thin Iron for Lawns, the Price will be less in Proportion to the Quantity of Iron abated. See p. 15. No. 42.

No. 47. TWO-HORSE CARTS, with a framed Bottom, Compass Shaft-flats, and Screw-bolts, and compleatly mounted with strong Stock-bands, Sand-pans, Buttons and Pins; Cuttoos affixed with Screw-bolts, strong Hurters, strong counter-sunk Hinges and Screw-bolts; strong Shaft-straps, strong Iron Standards, nutted and screwed; Iron Tail-pins and Chains; Iron Tail-board Lips and Bolts; Tug-pins, Chains and Staples; double-twisted twivled Back-bands, Staples and Hook; a strong Iron-sword Screw-bolt and Staple; Iron Trap-bolt, Staples and Screw-shaft Staples; strong and full sized Tire on the Wheels, counter-sunk and put on with Screw-bolts, &c. 12 Guineas. And mounted with Iron Arms, 13 Guineas. See p. 15. No. 42.

No. 48. ONE-HORSE CARTS, mounted in the same Manner as No. 47. with Wooden Axle-trees, 7 Guineas. With Iron Arms, 8 Guineas. See p. 15. No. 42.

No. 49. The FARMER'S CART for one Horse, mounted in the same Manner as No. 47, and with Iron Arms, and the Addition of Top-railing, calculated for drawing

drawing Hay, Straw, Corn in Sheaf or Sacks of Corn, Dung, Earth, &c. 7 Guineas. See p. 15. No. 42.

No. 50. A TURF CRADLE, for drawing Turf, or Grass, fitted to this Cart, No. 49; to be put on and taken off occasionally. One Guinea.

No. 51. BOMB CARTS of any Size.

No. 52. SMALL CARTS, of a new Construction, for Lawns or Grass Walks, which will not cut the Sod.

No. 53. WATER-CARTS of any Construction, either to fill themselves, or to be filled by Hand or Pump.

No. 54. LOW-BACKED CARS of a new Construction, mounted with Spoak Wheels, and bound with Counter-sunk Tire put on with Screw-bolts, Iron Arms put on with Screw-bolts, Wing-brackets and Screw-bolts, Tug-pins and Chains, double-twisted swiveled Back-band, Hook and Staples, 5 Guineas. When a double Centre Bracket, moulded Brackets behind, Shaft Brackets, and Shaft Lining, all firmly affixed with Screw-bolts, a Drag-staff hung on a Swivel, Screw Staple and suspending Chain, Cuttoos, Sand-Pans, Buttons and Pins, Tug-Pins and Chains are added, then the Price is 6 Guineas. See p. 16 to 22. No. 54.

No. 55. LOW-BACKED CARS, of a second Kind, mounted with Spoak Wheels and Iron Arms. 4 Guineas and an half.

N. B. This Car moves upon the same Principles, and works as easy as the above, No. 54, but is not so fortified with Iron and Screw-bolts, being calculated for Persons who cannot afford to pay for the Best. A Turf Cradle may be fitted to this also.

No. 56. SIDE-BOARDS, HEAD-BOARD, TAIL-BOARD, fitted to either of the above Cars, and mounted, with coupling Irons, Iron Brackets and Screws, with

A LIST of the
with Iron Tail-pins, Chains and Staples, for drawing
Dung, &c. 16s. 3d.

No. 57. A TURF CRADLE, for drawing Turf, suited to either of the Cars, to be put on and taken off occasionally, one Guinea. See p. 22.

No. 58. COACH, POST-CHAISE, CABRIOLE, and other WHEELS.

No. 59. SPOAKED WHEEL BARROWS of a neat and strong Kind. Half a Guinea a Piece.

No. 60. WHEEL BARROWS, for Gardens, with Broad-Rollers, for the Preservation of the Walks. 16s. 3d.

No. 61. WATER-BARROWS, for Gardens, with a Pair of Wheels of a new and compleat Kind. 3 Gu.

No. 62. LARGE WHEEL BARROWS, for Stables or Gardens, with a Spok Wheel, and Iron Brackets. 17s. 4d.

No. 63. The same BARROW, with an Hollow Roller, shod with Iron, and Iron Brackets for Gardens. 20 Shillings.

No. 64. A STABLE BARROW, with a Pair of three Feet Spok Wheels, shod with Iron, an Iron Axle-tree, and in every Respect made like a Cart, except that of having Handles for a Man to wheel it, instead of Shafts for an Horse. 4 Guineas.

No. 65. WEED-BARROWS for Gardens. 13s.

No. 66. GRASS-BARROWS for Soiling Plough Cattle when standing yoked in the Field. 13s.

No. 67. SHEEP-RACKS, of a compleat and new Construction, with Bevel Racks, running on Wheels, and Iron Arms. 3 Guineas.

No. 68.

No. 68. SHEEP-RACKS of a compleat and new Construction, with Perpendicular Racks, running on Wheels, and Iron Arms. 4 Guineas. Calculated to prevent Waste of Hay.

No. 69. FIELD-GATES of any Construction.

No. 70. GARDEN-SEATS, CHAIRS, and STOOLS, of various Kinds.

No. 71. ROLLERS for Corn and Meadow, of a compleat and new Construction.

No. 72. SPIKED-ROLLERS of any Construction.

No. 73. A ROLLER for reducing Fallows, be they ever so stubborn.

No. 74. FANNERS for Winnowing Corn in the Barn, when the Wind does not serve to Winnow out of Doors, or in the Passage of the Barn Doors. 3 Guineas and half.

No. 75. BRASS-WIRE-SIEVES for Corn and Seeds.

No. 76. HAY-RAKES, of a strong and neat Kind, 19s. 6d. per Dozen.

No. 77. IRON RAKES of various Kinds.

No. 78. HAY-FORKS, Handles, Ferrils, and Rivets neatly mounted, 2s. 8d $\frac{1}{2}$.

No. 79. HAY-PITCHING FORKS, with long Handles, Ferrils, Head, and Rivets, 3s. 9d $\frac{1}{2}$.

No. 80. THREE-PRONGED FORKS for Dung, compleatly mounted. 5s. 5d.

No. 81. THREE-PRONGED FORKS, for raising Stones or Rubbish out of Gardens. 5s. 5d.

No. 82.

No. 82. DRAG-FORKS, for unloading Dung in small Heaps on Land. 3*s.* 3*d.*

No. 83. DOCK-IRONS, for pulling up the Roots. 7*s.* 6*d.*

No. 84. The BRIER-DOG, with polished Cheeks, screw-bolted Arm, Block double-hooped, and double-banded Lever, for pulling up Thorns, &c. by the Roots. 1*l.* 14*s.* 1*d.* $\frac{1}{2}$.

No. 85. The STUMPING-IRON, for compleatly taking the Beards off Barley with Expedition. 13*s.*

No. 86. ENGINES for cutting Hay and Straw for Horse-Meat.

No. 87. VENTILATORS for Hay Ricks, by which the Hay may be saved without putting it in Tramp-Cocks.

No. 88. BEE-HOUSES and BOXES, for taking the Honey and Wax, without killing the Bees, consisting of an House, and six Octagon Boxes, for two Colonies. 7 Guineas. See p. 23. No. 88.

No. 89. CRIBS of a neat and new Construction for foddering Black Cattle. See p. 23. No. 89.

No. 90. The TURNIP SLICING ENGINE, a new Instrument for slicing Turneps for Black Cattle. See p. 23. No. 90.

No. 91. The STUBBLE HORSE-RAKER, calculated for pulling up and gathering Stubble at one Operation, where the Corn shall have been sown flat, either under the Harrow or Plough.

No. 92. The BROAD-CAST TURNIP HORSE-HOE, an Instrument for thinning and horse-hoeing Broad-cast Turneps.

No. 93.

No. 93. A Gentleman's WALKING POLE, six Feet long, with Brass Figures upon it, and Variety of neat and useful Tools, to put upon the Staff occasionally. 16*s.* 3*d.*

No. 94. BULLOCK HAMES, of a strong and neat Kind. 4*s.* 4*d.* a Pair.

No. 95. BILL HOOKS, home made, and well steeled and tempered. 2*s.* 2*d.*

No. 96. A STRETCHER for TRACES. 2*s.* 2*d.*

No. 97. TRACES of different Kinds, from 8*s.* 8*d.* to 11*s.* 4*d.* $\frac{1}{2}$ a Pair.

No. 98. LONG PLOUGH CHAINS, short Links, 9*s.* 9*d.* Short Plough Chains, 3*s.* 9*d.* $\frac{1}{2}$

No. 99. HORSE-HAMES, of strong compleat Kinds, for Ploughs and Carriages, from 6*s.* 6*d.* to 8*s.* 1*d.* $\frac{2}{3}$ a Pair.

No. 100. SUSPENDING-CHAINS for Ploughs, 3*s.* 6*d.* per Pair.

The LIST of LEATHER-HARNESS.

BRIDLES, of various KINDS.

No. 101. The very best *English* front Bridles, with Face Piece, Nose Piece, and Star Piece, elegantly ornamented with Work, lettered and dated, and furnished with Fringe, Bobs, Tossels and a Pair of Bells, and two Pair of Reins. 1*l.* 15*s.* 6*d.*

No. 102. The same Bridle, compleat, without Bells. 1*l.* 8*s.*

No. 103. The same Bridle, compleat, without Bobs, Tossels, or Bells, 1*l.* 5*s.*

No. 104.

No. 104. The same Bridle plain, without ornamental Work, Bobs, Tossels, or Bells, only bound, lettered and dated. 17s. 4d.

No. 105. The same Bridle, quite plain, without any ornamental Work, Letters, Date, Bobs, Tossels, or Bells. 14s. 6d.

No. 106. The very best Winker Bridles, lettered and ornamented with Work, the Front handsomely lapped, with Stays and Buckles to the Winkers, Tossels and double Reins. 14s. 6d.

No. 107. The same Bridle without Tossels, and with double Reins. 11s. 4d. $\frac{1}{2}$

No. 108. The same Bridle, neatly bound with Red Morocco Leather, lettered, without Tossels, and with single Reins. 8s.

No. 109. Neat Winker Bridles, single Reins. 6s.

N. B. All the above Bridles, are mounted with strong home-made polished Bits, and made of the best tanned Cow Leather, Black, that they may be kept clean, like Coach Harness, unless people chose them Brown.

No. 110. Common White Irish Winkers, from 14d. to 19d. $\frac{1}{2}$ a Pair.

NECK-COLLARS, for HORSES and BULLOCKS.

No. 111. The very best English tanned Cow Leather Neck Collars, double welted and bound, lined with soft Leather or Swan Skin, to absorb Sweat, faced with curled Hair, and mounted with large Housings, and that compleatly fringed, lettered, and elegantly ornamented with Work. 1l. 5s.

No. 112.

No. 112. The same Collar, with Housing, neatly lettered and fringed. 16s. 3d.

No. 113. The same Collar, with Housing, neatly lettered, and bound with Red *Morocco* Leather. 13s.

No. 114. The same Collar, without Housing. 9s. 9d.

No. 115. Good *Englisch* tanned Leather Collars, lined with Linen, double welted, faced with curled Hair and Wool, and handsome plain Housing, neatly bound. 11s. 4d. $\frac{1}{2}$

No. 116. The same Collar, without Housing. 7s. 6d.

No. 117. Plain *Englisch* tanned Leather Collars, single welted, lined with Linen, faced with curled Hair and Wool, and with plain Housing. 8s. 8d.

No. 118. The same Collar, without Housing. 5s. 5d.

No. 119. Plain *Englisch* Collars, made of White Leather, lined with White Linen, and faced with Wool. 5s. 5d.

N. B. These White Collars are chiefly for working in Mines, where the White Leather, from the Manner of its being manufactured, will last considerably longer than any tanned Leather, as Experience hath shewn in the Mines of *England*.

No. 120. The best hairy Collars, double welted, faced with curled Hair, lined with Linen, double bolstered, and made like *Englisch* Collars. 4s. 6d.

No. 121. Best *Irish* hairy Collars, lined with Ticken, faced with Hair and Wool, and covered with Side Pieces. 3s. 3d.

No. 122. The same Collar, lined with Ticken, and faced with Wool. 2s. 9d.

No. 112.

No. 123. The same, lined with Ticken, without Side Pieces, and stuffed with Straw. 2s. 2d.

No. 124. Best Collars for Plough Bullocks, made very large and full, double welted and double bolstered, faced with Hair and Wool. 7s. 6d.

No. 125. A cheaper Kind, at 5s. 5d.

N. B. I shall just observe here, for the Information of the Reader, that the Manner of making all these Collars, in the Part next the Throat of the Horse, for the greater Freedom of his Breathing, differs from the Manner practised in *Ireland*, in the Construction of Collars; which not being attended to, by the Collar-Makers here, (perhaps from the mirefable Kind of Work which they find the greatest Demand for) we thence, so frequently, hear a poor Animal, in an hard Draft, blowing as if his Wind is broke, from the Pressure of the Collar upon his Wind-pipe, although he be a sound Horse in that Respect. And I have had some of my Horses, which were good Cattle, sound, and in good Order, fall to the Ground under their Burthen, from this Circumstance. And Gentlemen cannot but have observed Carmen, (*more particularly when the Cattle have been their own*) frequently upon the Road, run in great Haste to stop their Horses, as soon as they hear them begin to blow, because they well know the Consequence, if the Horses are not stopped. And how pitiable a Case it is, that so valuable and generous a Creature, struggling in the Execution of his Office, even against the Pain of Strangling, by the Inaccuracy of constructing any Part of his Accoutrements, should be so near expiring, as to fall under his Burthen, Humanity will suggest.

The Housing to Collars, is not only ornamental, but useful; for it prevents the Rain running between the Collar and Shoulders of the Horse, where he is very apt to be injured, when the Housing is not used.

When

When Gentlemen order any Collars of me, they will please to let me know whether their Horses be large or small.

No. 126. Best Jockey Collars, faced with curled Hair, and lined with soft Leather, or Swan Skin. 6s. 6d.

No. 127. Common ditto. 5s. 5d.

No. 128. Best Chaise Collars. 6s. 6d.

No. 129. Common ditto. 5s. 5d.

CART-SADDLES, or STRADDLES.

No. 130. The very best *English* Cart Saddles, the Tree compleatly plated with Iron, and furnished with double Housings; those put on with Brass Nails, and elegantly lettered and ornamented with Work, the Pannel of tanned Leather, and lined with Hair; a broad Crupper neatly worked, and double-tongued Buckle; a worked Leather Pad to the Crupper, a Girth, and an Iron Spring on the Tree, to prevent the Back-band of the Carriage flying out, and a Swan Skin Saddle Cloth bound. 2l. 2s.

No. 131. The same Cart Saddle, with *Roman* Letters and Date on the Housings, and those bound with Red *Morocco* Leather, but no Saddle Cloth. 1l. 14s. 1d.¹/₂

No. 132. Good plain *English* Cart Saddle, with plain Housings, without Iron-Plates or Spring, faced with curled Hair, and a broad Crupper and Pad. 1l. 2s. 9d.

No. 133. Good plain *English* Cart Saddles, with a broad Crupper and Pad, lined with Swan Skin, and faced with curled Hair, neatly finished. 17s. 4d.

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No. 134.

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No. 134. Good plain *English* Cart Saddles, neatly finished, and narrow Crupper. 11s. 4d. $\frac{1}{2}$

No. 135. Plain *English* Cart Saddles, without Cruppers. 7s. 6d.

No. 136. Best *Irish* Cart Saddles, faced with Stuffing, and the best jointed Trees. 4s. 6d.

No. 137. Another Kind of ditto. 3s. 9d. $\frac{1}{2}$

No. 138. The Common ditto. 2s. 8d. $\frac{1}{2}$

No. 139. Block Cart Saddles, of all Kinds.

N. B. Here I shall observe, that Care is taken in the Stuffing these Cart Saddles, that the Pannel rises before and hind, so as not to press upon and wound the Horse, as is generally the Case with those I have bought here, from the Pannel not being properly cut or stuffed.

B E L L Y - B A N D S.

No. 140. Best *English* Belly-bands, with double tongued Buckles, neatly worked and ornamented, for the Shafts of Carts or Cars, to prevent the Carriage rising in ascending an Hill, or when the Load has been injudiciously put on too far behind. 7s. 7d.

No. 141. Plain Belly-bands for the same Purpose, with double Buckles. 5s. 5d.

No. 142. The same, for large Carriages, lined with Leather and worked. 11s. 4d. $\frac{1}{2}$

No. 143. Plain Belly-bands for Horses or Bullocks in Ploughs, or leading Horses in Waggon or Carts, from 2s. 2d. to 3s. 3d.

No. 144.

No. 144. Linked Belly-bands, double capped, and lined up, for Waggon or Carts. 4s.

BRITCHENS.

No. 145. Best *English* Britchens, double Hip Straps, compleatly finished, and elegantly ornamented with Work. To prevent a Carriage running upon an Horse or Horses, which are in it, in descending an Hill, or to enable the Horse in the Shafts to back the Carriage. 14s. 6d.

No. 146. The same Britchen, neatly finished, but not ornamented with Work. 12s.

No. 147. Best *Irish* Britchens, neatly made. 8s. 6d.

BACK-BANDS.

No. 148. Broad Back-bands, with double-tongued Buckles and Leather Pads, neatly worked and stuffed, for Ploughs. 8s. 8d.

No. 149. Broad Back-bands, with double Buckles and common Pads, for Ploughs. 6s. 6d.

No. 150. Narrower Back-bands, with single Buckles, and without Pads, for Ploughs. 4s. 6d.

No. 151. Broad Noose Back-bands, with worked Pads and Tossils, and handsomely ornamented, for the leading Horse or Horses, in Waggon or Carts. 9s. 9d.

No. 152. The same Back-bands, plain, with common Pads. 6s. 6d.

No. 153. The same Back-band, with double Iron Links instead of Nooses, with worked Pads and Tossils. 9s. 9d.

No. 154. The same Back-band, with single Iron Links, and common Pads. 6s. 6d.

BACK-CRUPPERS.

No. 155. Back Cruppers and Hip Straps, for the leading Horses in Waggon or Carts, handfomely worked, ornamented and fringed. 9s. 9d.

No. 156. The same plain, for Ploughs, Waggon, or Carts. 7s. 7d.

TRACE PIPES.

No. 157. Best tanned Leather Trace Pipes, for Waggon, Carts, or Ploughs. 5s. 5d. a Pair.

No. 158. Common ditto, neatly closed. 3s. 6d. a Pair.

No. 159. Common ditto, *Irish*. 2s. 8d.¹/₂ a Pair.

English WHALE-BONE WHIPS, &c.

No. 160. Best *English* Waggon Whalebone Whips, 9 Feet long. 9s. 9d.

No. 161. The same, for two or three Horse Carts, 7 Feet long. 7s. 7d.

No. 162. The same for driving Ploughs, 6¹/₂ Feet long. 6s. 6d.

No. 163. The same for a one Horse Carriage, 5 Feet long. 5s. 5d.

No. 164. An Elastick Whalebone Bullock Goad. 6s. 6d. I have been induced to think of this Article, from the Pain I have felt, at frequently seeing the Drivers

Drivers of Ploughs, unmercifully stabbing the Bullocks with a Nail, (commonly called a Prod) put into the End of a stubborn Stick, often to the great Pain of the Animal and Injury of its Owner: Circumstances, which cannot happen in the Use of this Goad.

SUNDRY ARTICLES.

No. 165. Straps for Hames, with a Buckle. 4*d*.

No. 166. Horse Netts, for Ploughs, Waggon, or Carts.

No. 167. Muzzles, made of the best tanned Leather, for Stallions, or Horse-hoeing drilled Crops. 4*s*. 4*d*.

No. 168. *Dutch* Head Collars or Halters, for Stables, with double Leather Reins. The best Kind. 6*s*. 6*d*.

No. 169. The same, such as are generally made. 5*s*. 5*d*.

No. 170. The same, with two Iron-linked Reins,

No. 171. The same, with single-linked Reins. 6*s*.

No. 172. The same, with a single Leather Rein. 4*s*.

No. 173. Common Head Collars, with single Reins. 2*s*. 8*d*. $\frac{1}{2}$

No. 174. White Jocky Collars, from 13*d*. to 16*d*.

No. 175. Best *English* Hedging Mittens, welted. 3*s*. 3*d*. For defending the Workman's Hand, in splashing or cutting Hedges, Faggots, or Furz.

No. 176. Common ditto. 2*s*. 2*d*.

No. 177. Millers and other Pads, in the *English* Form, for carrying Sacks on an Horse's Back.

No. 178. *Englsh* Hamper Pads, for carrying Hampers on an Horse's Back, with Straps and Bolsters.

No. 179. Hood Winks, for Horses in Mills or Pastures, from 2*s.* 2*d.* to 2*s.* 8*d.* $\frac{1}{2}$ a Pair.

No. 180. Bullock Suggons, of Bull-rush and Gaddened, from 14*d.* to 16*d.*

No. 181. Nossils and Tuggs, for a Shaft Horse to draw by, instead of Iron Chains and Rings, which I find injure the Shafts greatly, often the Collars, and sometimes the Horse. These are made of the best tanned Cow Leather, lined, handsomely worked, and with double tongued Buckles. 8*s.* 8*d.* a Pair.

No. 182. The same, made with white or hairy Leather, quite plain, and no Buckles. 5*s.*

No. 183. Black Leather Caps of different Kinds, for Ploughmen, Plough-drivers, Carmen, Waggoners, Post-Chaise Boys, or Laborers.

No. 184. Black Velvet Caps, for Gentlemen or Farmers, of any Kind.

No. 185. Saddles and Bridles, made in the *Englsh* Manner, of various Kinds.

No. 186. Side Saddles of all Kinds.

No. 187. *Englsh* Pads of all Kinds, for Women.

No. 188. Pillions of all Kinds, and Pillion Cloaths.

No. 189. Mail Pillions.

No. 190. Leather Bags and Portmanteaus.

No. 191. Watering Bridles, for Coach-Horses.

No. 192. Coupling Reins, from 19*d.* $\frac{1}{2}$ to 2*s.* 2*d.*

The

The last Number having finished my List, I shall now, for the Convenience, and readier Information of Gentlemen, who may wish to supply themselves with compleat Sets of Instruments *for Tillage*, endeavour to state distinct Tables, of Sets of Ploughs, and their necessary Appurtenances; with Sets of Harness, and their Appurtenances: And as the latter differs in Price, so I shall give distinct Tables thereof, referring by the respective Numbers, to the Articles in the List at large, as I have done in the Harness for the Drill Husbandry, in p. 26. No. 7. And all these distinct Sets I shall distinguish under the Letters of our Alphabet, beginning with the Letter A. So that when any Person means to have a compleat Set or Sets of any of the following Articles, he will please to name the *Letter*, under which the *Column* stands, and the Number of Sets he would have, of the Article or Articles that he may want; and I shall, thereby, instantly know the Kind he would have, in Point of *Quality*. And this Method will be essentially necessary to be observed, in the ordering Harness for any particular Purpose.

A Set

A Set of Ploughs, for four Horses or Bullocks, for making Fallow, and for fowing Corn, either in small Ridges, or in Broad Sets under the Plough, with their necessary Appurtenances, viz.

	A.			B.			C.			D.				
	No.	l.	s.	d.	l.	s.	d.	l.	s.	d.	l.	s.	d.	
The Block Plough	9	at	2	10	0	2	10	0	2	10	0	2	10	0
The Lomax, or Seeding Plough, to draw single, wider in the Sole than the following,	15	2	5	6	2	5	6	2	5	6	2	5	6	
The same Plough, narrower in the Sole than the above, and why. See Page 11 and 28. No. 15.	15	2	5	6	2	5	6	2	5	6	2	5	6	
The Sledge for the Block Plough,	22	0	10	0	0	10	0	—	—	—	—	—	—	
Two Sledges for the Seeding Ploughs,	23	0	7	0	0	7	0	—	—	—	—	—	—	
Two Plough Hammers,	24	0	3	9½	—	—	—	0	3	9½	—	—	—	
Two Plough Paddles,	25	0	1	7½	—	—	—	0	1	7½	—	—	—	

The Block Plough	—
The Lomax, or Seeding Plough, to draw single, wider in the Sole than the following,	—
The same Plough, narrower in the Sole than the above, and why. See Page 11 and 28. No. 15.	—
The Sledge for the Block Plough,	—
Two Sledges for the Seeding Ploughs,	—
Two Plough Hammers,	—
Two Plough Paddles,	—

The Reader, it is presumed, will immediately see, that if he would have all the Articles, he is to order the Column A. If no Hammers or Paddles, the Column B. If no Sledges, the Column C. And if neither Sledges, Hammers, or Paddles, the Column D.

A Set

A Set of Harrows, for four Horses, or Bullocks; for the Purposes of reducing Ground, and sowing Corn under the Harrow, with their necessary Appurtenances, viz.

A. B. C.

No.	A.			B.			C.		
	<i>l</i>	<i>s.</i>	<i>d.</i>	<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>l.</i>	<i>s.</i>	<i>d.</i>
34 at 3	16	7		at 3	8	3	at 3	8	3
35 3	6	8		3	0	0	3	0	0
36 0	16	3		0	16	3	0	0	0
37 0	14	0		0	14	0	0	0	0
30 0	12	0		0	12	0	0	12	0

One Pair of four Horse Harrows,

Two Pair of two Horse Harrows,

A Sledge for No. 34. —

Two Sledges for No. 35. —

One Set of Swingle-trees, with a }
short Chain, —

The Reader will observe, that in the Column A, the Harrows are to be rivetted B, not rivetted, both the Sets having the proper Sledges, but in the Column C, the Harrows will not be rivetted, neither are the Sledges included in that Column. The Swingle Tree, No. 30, are necessary to the working the second two Horse Harrow.

A Table

A TABLE, containing compleat Harness for four Horses, of different Qualities, in four distinct Columns, referring by the Numbers, to the respective Articles in the preceding List.

Names of the ARTICLES.	A.			B.			C.			D.		
	No.	l.	d.	No.	l.	d.	No.	l.	d.	No.	l.	d.
Four Bridles, —	107	at 11	4½	108	at 8	0	108	at 8	0	109	at 6	0
A Pair of Coupling Reins, —	192	2	2	192	2	2	192	1	7½	—	—	—
Four Neck Collars, —	115	11	4½	116	7	6	120	4	6	121	3	3
Four Hame Straps, —	165	0	4	—	0	4	—	0	4	—	0	4
Four Back-bands, —	148	8	8	148	8	8	149	6	6	150	4	6
Four Belly-bands, —	143	3	3	143	2	2	143	2	2	143	2	2
Four Back Cruppers and Hip Strap, —	156	7	7	156	7	7	156	7	7	—	—	—
Four Pair of Trace Pipes, —	157	5	5	157	5	5	158	3	6	159	2	8½
Four Pair of Collar Hames, —	99	6	6	99	6	6	99	6	6	99	6	6
Four Pair of Traces, —	97	11	4½	97	10	10	97	10	10	97	8	8
One Long Plough Chain, —	98	9	9	98	9	9	98	9	9	98	9	9
One Pair of suspending Chains, —	100	3	6	100	3	6	100	3	6	100	3	6
One Set of Swingle-trees, and a short Plough-Chain, —	30	12	0	30	12	0	30	12	0	30	12	0
One Set ditto, without a Chain, —	30	9	0	30	9	0	30	9	0	30	9	0
One Whale-bone Whip, —	162	6	6	162	6	6	—	—	—	—	—	—

M. B. Thus, four Horses are furnished with compleat Tackling, by which they cannot be cut or hurt; for working the four Horse Plough, No. 9. The four Horse Harrows, No. 33. The two Seeding Ploughs, No. 15, and the two Horse Harrows, No. 34. Only with this Difference, that when the compleat Set of Ploughs, A, are ordered, with any one of these Columns of Harness, A, B, C, or D, that two Pair of the Traces will be made longer than would be necessary for working four Cattle to the Plough No. 9, only, and these two longer Pair of Traces are for the leading Horses, in working the Ploughs, No. 15. The same Rule will be observed in the Harness for four Bullocks, (which follow in the next Tables,) when the Set of Ploughs, A, shall be ordered with Harness. But when only a four Horse Plough and Harness shall be ordered, then the Traces will be all of a Length.

A TABLE,

A TABLE, containing complete Harnesses for four Bullocks, of different Qualities, under five distinct Columns, referring by the Numbers to the respective Articles in the preceding List, viz.

Names of the ARTICLES.	A.			B.			C.			D.			E.		
	No.	s.	d.	No.	s.	d.	No.	s.	d.	No.	s.	d.	No.	s.	d.
Four Bullock Suggons, — — —	180	at	1 4	180	—	—	180	1	2	—	—	—	125	5	5
* Or Four Neck Collars, — — —	—	—	—	—	—	—	—	—	—	124	7	6	148	8	8
Four Back-Bands and Pads, — — —	148	—	8 8	149	6	6	130	4	6	148	8	8	148	8	8
Four Belly-Bands, — — —	143	—	2 2	143	2	2	143	2	2	143	2	2	143	2	2
* Four Hame Straps, — — —	—	—	—	—	—	—	—	—	—	165	0	4	165	0	4
Four Pair of Pipes, — — —	118	—	3 6	158	3	6	159	2	8½	157	5	5	158	3	6
Four Pair of Bullock Hames, — — —	94	—	4 4	94	4	4	94	4	4	—	—	—	—	—	—
Four Pair of Traces, — — —	9	—	10 10	97	10	10	97	4	8	97	10	10	97	10	10
One long Plough Chain, — — —	98	—	9 9	98	9	9	98	9	9	98	9	9	98	9	9
One Pair of Suspending Chains, — — —	100	—	5 6	100	3	6	100	3	6	100	3	6	100	3	6
One Set of Swingles, and short Chain, — — —	30	—	12 0	30	12	0	30	12	0	30	12	0	30	12	0
One Set ditto, without a Chain, — — —	30	—	9 0	30	9	0	30	9	0	30	9	0	30	9	0
One Elastic Plough Goad, — — —	164	—	6 6	—	—	—	—	—	—	164	6	6	164	6	6
* Four Pair of Horse Hames, — — —	—	—	—	—	—	—	—	—	—	99	6	6	99	6	6

Thus four Bullocks are furnished with complete Tackling, by which they cannot be cut or hurt, for working the four Horse Plough, No. 9, the four Horse Harrows, No. 33, the two Seeding Ploughs, No. 15, and the two Horse Harrows, No. 34. The Columns A, B, and C, contain the Harnesses for Bullocks to work with Suggons, No. 183, and to every Article diminishes in Price, from the Column A to the Column C, both inclusive. But as it is a much better and safer Method to work Bullocks in Collars, as we do Horses, I have named them in the Column of Articles, and marked them thus *, and carried them on to two other Columns, D and E, with all the other necessary Articles, diminishing in Price, from D to E; so whatever Quality any Person would have, he is to distinguish it by the Letter, at the Head of the Column he fixes upon.

A TABLE,

A T A B L E, containing compleat Harness for three distinct Columns, referring by the Numbers to the ref

	A.				B.			
Names of the ARTICLES.	No.	l.	s.	d.	No.	l.	s.	d.
A Bridle for the fore Horſe, — —	101	1	15	6	102	1	8	0
Two ditto, for the two hind Horſes, — —	106	0	14	6	106	0	14	6
Three Neck Collars, — — —	111	1	5	0	111	1	5	0
Two Pair of Hames, for the two fore Horſes, — —	99	0	6	6	99	0	6	6
One Pair ditto, for the ſhaft Horſe, — —	99	0	6	6	99	0	6	6
A Pair of Noffils and Tugs, — — —	181	0	8	8	181	0	8	8
Three Hame Straps, — — —	165	0	0	4	165	0	0	4
Two Pair of Cart Traces, — — —	97	0	11	4½	97	0	11	4½
Two Stretchers, for the two fore Horſes, — —	96	0	2	2	96	0	2	2
Two Pair of Trace Pipes, — — —	157	0	5	5	157	0	5	5
Two Back-Bands, for the two fore Horſes, — —	151	0	9	9	148	0	8	8
Two Belly-Bands, for ditto, — — —	143	0	3	3	143	0	3	3
Two Back Cruppers, — — —	155	0	9	9	155	0	9	9
One Cart Saddle for the Shaft Horſe, — —	130	2	2	0	130	2	2	0
One Shaft Belly-Band, for ditto, — —	142	0	11	4½	140	0	7	7
One Britchen, for ditto, — — —	145	0	14	6	145	0	14	6
Three Horſe Nets, — — —	166	—	—	—	—	—	—	—
One Whale-Bone Whip, — — —	160	0	9	9	160	0	9	9

Thus I have endeavoured to range the different Qualities of Columns, so that by naming the Letter, at the Head of any one man would have. This Table will answer for two Horfes in a

Horses in a Cart, of different Qualities, in six
pective Articles, in the preceding List, *viz.*

C. D. E. F.

No.	l.	s.	d.	No.	l.	s.	d.	No.	l.	s.	d.	No.	l.	s.	d.
103	1	5	0	104	0	17	4	106	0	14	6	107	0	11	4½
107	0	11	4½	108	0	8	0	108	0	8	0	109	0	6	0
112	0	16	3	112	0	16	3	115	0	11	4½	116	0	7	6
99	0	6	6	99	0	6	6	99	0	6	6	99	0	6	6
99	0	6	6	99	0	8	1½	99	0	8	1½	99	0	8	1½
181	0	8	8	—	—	—	—	—	—	—	—	—	—	—	—
165	0	0	4	165	0	0	4	165	0	0	4	165	0	0	4
97	0	11	4½	97	0	11	4½	97	0	11	4½	97	0	11	4½
96	0	2	2	96	0	2	2	96	0	2	2	96	0	2	2
157	0	5	5	158	0	3	6	158	0	3	6	158	0	3	6
148	0	8	8	152	0	6	6	152	0	6	6	152	0	6	6
143	0	2	2	143	0	2	2	143	0	2	2	143	0	2	2
156	0	7	7	156	0	7	7	156	0	7	7	156	0	7	7
131	1	14	1½	131	1	14	1½	132	1	2	9	133	0	17	4
141	0	5	5	141	0	5	5	141	0	5	5	141	0	5	5
146	0	12	0	146	0	12	0	146	0	12	0	147	0	8	6
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
160	0	9	9	160	0	9	9	160	0	9	9	—	—	—	—

Harnes, for three Horses in a Cart, under distinct
Column, I shall at once know the Kind any Gentle-
Cart, as Tackling for one may be omitted.

The

The Nature of this Undertaking is attended with such a constant Demand for ready Money, that I hope, whoever may favour me with their Commands, will not expect any Credit, as the Nature of the Undertaking will not admit of it.

It is requested of every Person who may send any Orders by Letter, that they will please to add the Number which is annexed to the Articles in the preceding List to such Instruments as they may please to order, which will effectually prevent any Mistakes. And also, to specify whether they would have any extra Coulters or Socks to such Ploughs as may be ordered; the latter will always be necessary, when the Ploughs are to go to any great Distance, because no other Socks will fit my Ploughs but my own Pattern; the Reasons for which, see Page 9, in my Explanation of the BLOCK PLOUGH, No. 9.

N. B. It has for some Time past been made a Practice to invite my Artificers to do what is called little Jobs for other Persons, inconsiderately, I am willing to hope; because a Moments Reflection would convince any Gentleman, that nothing can be more indelicate and unreasonable, not to use a severer Term, than privately, and to the Interruption of my Business, to call away Men whom I have imported, collected and instructed at a great Expence, whom I constantly maintain, together with their Families, and who are to return to me, when the Purposes of the Persons so inviting them are served. Some recent Instances of this Kind, added to many preceding Ones, obliges me to mention it thus publicly, which I hope will so effectually prevent a repetition of it, as to render it unnecessary for me to take any further Notice of it.

T H E E N D.

Qualities, in eleven distinct Columns, relating List, *viz.*

	H.			I.			K.			L.					
No.	l.	s.	d.	No.	l.	s.	d.	No.	l.	s.	d.	No.	l.	s.	d.
One	0	8	0	108	0	8	0	108	0	8	0	109	0	6	0
One	0	7	6	118	0	5	5	120	0	4	6	121	0	3	3
One	0	17	4	134	0	11	4½	135	0	7	6	136	0	4	6
One	0	5	5	141	0	5	5	—	—	—	—	—	—	—	—
One	0	12	0	147	0	8	6	—	—	—	—	—	—	—	—
One	0	8	1½	99	0	8	1½	99	0	8	1½	99	0	8	1½
Not	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
One	0	0	4	165	0	0	4	165	0	0	4	165	0	0	4
One	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
One	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Qualities of Harness for an Horse, in a one Horse Carriage, under their respective Column, referring by the Necessary Thing that can be wanting, for compleatly furnishing people, to which I thought it unnecessary to give a Place necessary in a flat Country, though always very Useful the Whip, No. 163, or the Net, No. 166, and L, I have totally omitted these Articles. And

T H E I N D E X.

D.

DRILLED and Common Husbandry compared,
Page 23. 28. 30.

L.

Lucerne, Experiments on, 45
 Hay made of it, and Calculations on the Pro-
 duce, 56
 Dairy Cows fed with it, with various Experi-
 ments on that Point, 46
 Calculations thereon, 53

O.

Oats, Ground twice ploughed for, 16. 26
 Impediments to ditto, 22
 Ground once ploughed for, 20. 28
Oats, a Barrel, how much it is, Note, 21
Oats, sown to stand the Winter, 34
 Considerations on ditto, 40
 Sown in Spring, 34
Oats, a particular Kind, some account of them, 37

S.

Straw, injudicious to sell it, 15

W.

Wheat, second Crop in Drills, 9
 A Barrel, how much, Note, 13
 Injured by a Fly, 32

F I N I S.

EXPERIMENTS IN AGRICULTURE,

Made under the DIRECTION of
The RIGHT HONOURABLE and HONOURABLE
DUBLIN SOCIETY,
In the Year 1769.

In which the CABBAGE HUSBANDRY is particularly
explained, and the cheap Maintenance of CATTLE,
both in Summer and Winter largely treated upon,
with several other Interesting Subjects.

BY
JOHN WYNN BAKER, F. R. S.
And EXPERIMENTER in AGRICULTURE to the
DUBLIN SOCIETY.

EV, 53
DUBLIN:
Printed by S. POWELL, for the AUTHOR.
AND

Sold by G. FAULKNER, at the Corner of *Parliament-street*,
and the PRINTER hereof, in *Dame-street*.

M DCC LXXI.

T O T H E

R E A D E R.

IN the Course of my former Publications, I have ever avoided the Introduction of the annual Resolutions of the DUBLIN SOCIETY upon my Conduct; and I have in general, as carefully avoided Quotations from other Writers, who have done Favour to my Name, because I ever wished to gain the favourable Opinion of Mankind by my Actions, and not by retailing the Honours which the DUBLIN SOCIETY have conferred upon me, or the kind Opinions which generous Writers have expressed upon my Pursuits.

In the Introduction to the present Report, I have been unavoidably led to deviate from this Rule, not from any Disposition I have to shew the World how other Writers think of my Endeavours in the Path I have chosen to serve the Publick; but because I really thought it my Duty; and when a Man's own Feelings come in Competition with the publick Good, every honest Mind will compel the Former to give Way to the Latter.

Some Persons, who are unacquainted with the Practice of Agriculture, and seem perfect Strangers to it's Importance to Mankind, have conceived, or at least have said, that "*Experimental Enquiries are useless*"—I have made the few Quotations to shew how much mistaken People are who offer such Sentiments—to shew them, that Men of

To the READER.

Knowledge and Experience in this Science, are of a different Opinion—and to shew them, that our Experiments, although made in *Ireland*, have been of some Use to *England*.—When it is considered, that such Circumstances are not disgraceful to this Kingdom—I flatter myself, that the *candid* Reader will admit them as a sufficient Apology for the Quotations which I have made—those acquainted with the modern Writers can be Judges, whether I have taken more than I ought, or all that I might.—

As to the following Sheets, I offer them to the World, as a meer Relation of Facts; if the Information they afford, shall be sufficiently striking, to invite Landholders to adopt the Ideas therein recommended to their Attention, my End will be fully answered.—And as to prefixing a Preface to it, it would only be to inform them of the Subject Matter, which the ninth Page of the Introduction will as effectually do, and therefore, without a Preface, I present it to them, with the sincerest Wishes to do them Service.

ADVERTISEMENT.

WHEREAS a Post Office is lately established at *Leixlip*, Mr. *Baker* requests that all Persons who shall hereafter correspond with him, will be so kind as to direct for him near *Leixlip*, as heretofore his Letters going to *Maynooth*, has been attended with much Inconvenience, and frequent Delays.

TO THE
RIGHT HONOURABLE and HONOURABLE
DUBLIN SOCIETY,
THIS
REPORT
OF
EXPERIMENTS in AGRICULTURE,
IS GRATEFULLY INSCRIBED

By their Faithful,

And most Devoted,

Humble Servant,

JOHN WYNN BAKER.

LAUGHLINSTOWN,
May 28th, 1770.

A

INTRODUCTION.

On the 20th Day of *April*, 1769,

T H E

DUBLIN SOCIETY

Were pleased to make the following
O R D E R, *viz.*

“ ORDERED,”

“ **T**HAT it be an Instruction to Mr. *Baker*, to
“ extend his Experiments, in Regard to the
“ Maintenance of Cattle, both in the Summer and
“ Winter Seasons.”

There is more comprised in the above Instructions than will be imagined by many. Upon my first Engagement with the Dublin Society, the cheap pasturing of Cattle, in the Summer and Winter Seasons, was my Object, because I conceive that to be the Basis of good Husbandry; nay, of the best; it always having struck me as the fundamental Principle upon which true rural Oeconomy should move, because, such Plants as

are fittest for those Purposes, will prepare Land for the Reception of Corn, beyond any other Method hitherto practised, or that I believe ever will be discovered; over and above the very important Objects of maintaining a great Number of Cattle upon a small Quantity of Ground, and above all, thereby collecting great Quantities of Manure, which will every Year accumulate by this Pursuit.

But the different Instructions which I have received from Time to Time, diverted me, in a great Measure, from the extensive Pursuit of this Practice, until the past Year.—Had we gone on, from the Beginning with this Object, we should have been much beforehand with *England*, where great Quantities of Cabbages are now cultivated for the Winter pasturing of Cattle.

However, we have the Pleasure of having contributed something to that Improvement in *England*; because the Field Culture thereof, for the Purposes of Feeding Cattle, was scarcely known, until after my Report for the Year 1764; and upon which Subject, Doctor *Templeman*, late Secretary to the Society in *London*, corresponded with me*, respecting the Mode of their offering Premiums, for the Encouragement of the Cabbage Husbandry.

* See my Report for the Year 1765, p. 3; and Mr. *Dofes* Memoirs on Agriculture, publishing the Transactions of the *London Society* by their Authority.—Where he says, p. 67, “When the Society was in Pursuit of discovering a Winter *Pabulum*, their Secretary was directed to write to the Persons distinguished for Knowledge in Matters of this Kind, in every Part of *Europe*, to enquire what was the Practice in their respective Countries, as to this Point. Answers were duly returned from them, but without supplying such Lights as might have been hoped for. The Sentiments likewise of the most able Persons at Home, were given on this Subject; and the Turnep-Cabbage, Boor-Cole, White Chinese Vetch, Siberian Medicogo, Futz, and some others, were recommended.”

The

The Premiums † of that Society, and, I hope I may say, the Re-publication of, and repeated Quotations from my Papers in *London*, have had wonderful Effects in promoting the Field Culture of Cabbages, for the Purpose of Winter Pasturing, and Fattening Horned Cattle and Sheep; as appears in the six Months Tour of the ingenious and indefatigable *Arthur Young, Esq*; whose zealous and spirited Endeavours, in the Cause of Agriculture, can be equalled by Nothing but those Abilities which display themselves in a Strength of Reasoning, through his Writings, which would do Honour to a *Pitt*, or a *Demosthenes* ‡.

In his fourth Volume, Page 162, I find the following Paragraphs.

“ You certainly must have remarked, in the Minutes of this journey, that no Tillage Crop (all which I think we should consider, before we come to Grass Lands or General Oeconomy) makes so distinguishable a Figure as *Cabbages*. This Branch of Field Culture is new in *England*. I do not remember Cabbages being expressly treated of, as Food for Cattle, in any Book of Husbandry, until Mr. *Randal* published his *Semi Virgilian Husbandry*, a few Years ago. He there recommends the Culture of the large *Scotch*, for fattening Oxen; enters particularly into Directions how to prepare for them, and asserts their being particularly profitable. As that Gentleman was a practical Farmer, I take it for granted that he cultivated them, though I think he does not expressly mention it. He does not insert one Experiment upon them: the Preparation he recommends is prodigiously expensive; more so, I ap-

† See Mr. *Doffie's* Memoirs, p: 68. “ The Society have also proposed Premiums for the *Turnep-Cabbage* and *Boor-Cale*. They were partly determined to this, by the Accounts of Mr. *Wynn Baker's* Experiments in *Ireland*.”

‡ See those incomparable Papers, entitled the Farmer's Letters to the People of *England*.—And the powerful Conclusions he draws, at the End of his fourth Volume, from his Six Months Tour.

prehend,

prehend, than Trench-digging Land two Feet deep; in-
 somuch, that the Culture of this excellent Vegetable
 would never have extended itself, if such costly Me-
 thods had been considered as really requisite."

"The Publick heard nothing further, upon this
 Branch of Agriculture, 'till Mr. *Wynn Baker*, under
 the Patronage of the *Dublin Society*, published some Ex-
 periments upon the *Turnep-Cabbage* and *Boor-Cole*: They
 were few, but extremely valuable, executed with an
 Accuracy, and related with a Precision not often found
 in Writings upon Husbandry. Since the Publication of
 Mr. *Baker's* Report, we have had no fresh Intelligence
 concerning Cabbages."

It is with particular Satisfaction, that I find my En-
 deavours in this Branch of Husbandry, has at all in-
 duced the People of *England* to introduce the Culture of
 Cabbages; though they seem more fortunate, either in
 the Species they have chosen, or in Climate, than I have
 been, of which I shall say more in the proper Place,
 when treating upon the following Experiments.

I likewise have the Happiness to know that the like
 Culture is extending over this Kingdom, from the ex-
 tensive Correspondence I have upon the Subject.

The *Turnep-Cabbage**, which I introduced in my
 Field Experiments, has been productive of another
 Plant

* See Dictionary of Husbandry, Article *Turnep-Cabbage*.
 "Mr. *Baker*, nevertheless, whose Report on this Subject, to
 "the *Dublin Society*, the Reader will find under the Article
 "Turnep, must have the Honour of being the First, who in-
 "troduced this Plant into Use, as an Article of Husbandry.
 "For it was on the Authority of his judicious Experiments,
 "related in that Report, the same Gentleman, who formerly
 "recommended the Turnep-Cabbage, to the *London Society*,
 "induced them last Year, to offer a Premium for its Cul-
 "ture: And there is no one Object of a similar Nature, hi-
 "therto taken into Consideration, either by this Society, or
 "that of *Dublin*, which bids fairer for being of great pub-
 lic

Plant of the same Kind, called the *Turnep-rooted Cabbage*, obtained from *Holland* by Accident, by one Mr. *Reynold's* in *Kent*, who found a Difficulty in obtaining the Seed of mine in *England*, and therefore sent to *Holland* for it, he intending to be a Claimant for the Premium of fifty Pounds, offered by the *London Society*, for the Culture of the *Turnep-Cabbage*; but instead of the Seed thereof, he received the Seed of that, now known by the Name of the *Turnep-rooted Cabbage*, by Way of Distinction.

Much has been said, in the late Publications of *England*, in Favour of this Plant, and I believe with great Truth, for last Spring I obtained a few Grains of the Seed; but by the Turnep Fly, I lost all the Plants except one, which I nursed with great Care, and still have it. Upon the Whole, I am induced to believe, from the Experience of Mr. *Reynold's*, and the Appearance of the Plant I have, that his Turnep-rooted Cabbage may be cultivated to Advantage, for the Purposes of Winter and Spring Pasturing of Cattle. But of this, I shall be able to say Something, with more certainty, in my Report for the Year 1770.

These Events demonstrate the Importance to the Publick, of making Experiments in Agriculture, and of publishing them to the World; more than any other Method of Intelligence can possibly do*. The Spirit-
and

“ lic Utility: As this Plant seems to answer all the Ends of
“ what was sought for, with so much Pains and Attention,
“ in the Research set on Foot by Mr. *Wych*, after a proper
“ *Winter Pabulum* (as it was called by him) for Cattle in
“ scarce Winters.”

* In farther Testimony thereof, see *Doffie's* Memoirs, Preface, p. 14. “ There is yet another Source of Information,
“ relating to Agriculture, that should not escape our Notice.
“ It is, the Report made, from Year to Year, by Mr. *Wynn*
“ *Baker*, of the Effects of his Trials and Experiments; which
“ are performed under the Protection, and with the Support
“ of the *Dublin Society*; and conducted by him with Ingenui-
“ ty and Judgment. — Though these Reports are Published, by
“ Mr.

viii I N T R O D U C T I O N .

and Emulation which they raise, are productive daily, of new Discoveries, and extensive Improvements.

And so ambitious am I, of being foremost in such a Cause, that I cannot avoid, in Exclamation, to curse my Stars, that I have not the Fortune of a Nabob or a Gideon, that I might exhibit such Fields, as might animate the World.

The Instructions which the Society honoured me with on the 20th of *April*, 1769, afforded me Pleasure, because I was, in some Measure, prepared to execute their Instructions; and because those Kind of Experiments lead to the Cultivation of Grain, as well as the Progressive Improvement of the Farm, upon which such a Chain of Cultivation is carried on.

Prior to the Relation of my Experiments, for the Year 1769, I shall collect together, for the immediate Inspection of the Reader, the several Plants which have experimentally engaged my Attention, during the past Year; the Particulars of which are as follow.

“ Mr. *Baker* in *Ireland*; yet they come to the Hands of very few here: But by their being inserted in this Work; the Publick may reap the full Advantage of them, as they will thence be laid open to all, who may wish to peruse them.”

P L A N T S

PLANTS UNDER EXPERIMENT,

In the YEAR 1769.

- | | | |
|-----|--|---------------------------|
| Nº. | 1. The Summer Use of Broad Red Clover. | |
| | 2. The Red, or Sheep Turnep, | } Comparatively. |
| | 3. The Yellow Turnep, | |
| | 4. The White Tankard Turnep, | |
| | 5. The White Norfolk Turnep, | |
| | 6. The Green Turnep. | |
| | 7. The Green Boor-Cole, | Autumn and Spring Plants. |
| | 8. The Turnep-Cabbage, | Spring Plants. |
| | 9. The Red Cabbage, | Spring Plants. |
| | 10. The Long-sided Cabbage, | Autumn Plants. |
| | 11. The Flat Dutch Cabbage, | Autumn Plants. |
| | 12. The Scotch Cabbage, | Autumn and Spring Plants. |
| | 13. The Anjou Colewort. | Autumn and Spring Plants. |
| | 14. Chou du Milan, | Spring Plants. |
| | 15. Jerusalem Colewort, | Spring Plants. |
| | 16. Red Brocoli, | Spring and July Plants. |
| | 17. Purple Brocoli, | Spring and July Plants. |
| | 18. White Brocoli, | Spring and July Plants. |
| | 19. Rape. | |

EXPE.

EXPERIMENTS

IN

AGRICULTURE.

Some Account of the Summer Maintenance of Horned Cattle, Horses, and Swine, upon Broad Red Clover, with several occasional Observations, as they occurred, in this Use of the Clover.

THAT Horned Cattle, Horses, and Swine will eat, and thrive upon Red Clover, is not what the Publick wanted Information upon*; but the most profitable Manner of using the Clover for these Purposes, I conceive to be an Object of more Consequence, than has hitherto been considered, either by Writers upon Agriculture, or Practical Farmers.

* For Horned Cattle indeed, this Vegetable is in very little Use, because a general Fear is spread through Mankind, in the Feeding this Species of Animal with it, from the dangerous Consequences, which many, very many have experienced.—But in the Course of this Subject, we shall endeavour to direct them, from Experience, how to guard against the Danger,—and to Remedy it when incurred.

The

The Field, devoted to this Purpose, contains twelve Plantation Acres; and was in the Year 1766, under Variety of Experiments; in the Year 1767, it was under Wheat; the Year 1768, under Oats; upon them was sown Clover Seed, and in the Year 1769, under the Clover, the Use of which is now to be the Subject before us.

Two Acres of the Clover in this Field I intended for Seed, and therefore it was necessary to Graze down the first Growth, until the Beginning of *June*, which I accordingly did; having turned in my Horses every Morning and Evening to Graze, but keeping the Persons who followed them in their Business, in the Field during the Times of Grazing, to prevent their ranging over the Field at large.—By this Means I had only remaining about ten Acres of the Field, for the Purpose of Mowing the Pasture; and of those ten Acres, I may very safely deduct one Acre, for a pard Head-land, not yet under Profit, another Head-land under Potatoes, about half an Acre of wet, course Ground, not yet improved, and for Ditches and Fences; so that I reckon I had only nine Acres of mowable Pasture.

On the 24th of May, although the Clover was not so high as I wished, yet I was obliged to begin to mow it, to serve the Swine, of which I had at that Time eighty-three Head; some large, some midling, and some small ones; but that the Reader may not imagine too greatly of this Number of Swine, I must premise, that I had not above three or four very large ones; but upon the Whole, if they had been all Fat, I apprehend they would have weighed upon an Average, three Quarters of an Hundred a Piece.

This Number and Kind of Swine were fed twice a Day, with mown Clover, out of the Field already described.

On the sixth of *June*, I began to mow Clover for the Horned Cattle, and Horses also.

Of

Of the Horned Cattle, I had thirty-eight Head, and of the Horses *nine*. None of these Cattle were suffered to lie out one Night, during the Time, in which the Clover stood mowing for them; *i. e.* from the 6th of *June*, until the 26th of *August*; (nor afterwards, until Harvest was over) and then the Clover became too short for Mowing. About five Acres of it was mowed twice. When it became too short for Mowing, I then turned in all the Stock already mentioned, every Morning and Evening, except the Swine; for them I had another Resource, as will appear hereafter.

The Grazing upon the Field, thirty-eight Head of Horned Cattle, and nine Horses every Morning and Evening, continued regularly without any other Food, until *Michaelmas*, the whole Stock still put in their Houses every Night, except *four* Plough Bullocks, *three* Milking Cows, and *the Horses*, for the last Month, were left out at Nights. But it must be observed, that every Day, the running Stock of Horned Cattle were turned upon a Common adjoining my Farm, not for what they could get, for it is always quite bare, being always overstocked, but for Air, and to stretch their Legs.—The Clover afforded a good deal of occasional Pasture afterwards, which I did not attend to the Particulars of, as now, Harvest being over, a great Range was obtained for the Cattle.

Least the Reader should imagine, that the Horned Cattle were all of full Growth, it will be highly proper for me to describe their several Ages and Sizes.

- 4 Large Plough Bullocks.
- 3 Milking Cows.
- 4 Three Years Old Bullocks.
- 6 Three Years Old Heifers.
- 7 Two Years Old Bullocks.
- 3 Two Years Old Heifers.
- 11 Yearling Calves.

38 Head.

14 Some Account of the Summer Maintenance

Grazing the Horses upon the two Acres which was intended for Seed, until the 6th of *June*, I do not reckon upon, because that two Acres we have seen was intended for another Purpose, and therefore could not be converted to the most Advantage as Pasture; and it is very remarkable, that, that Part of the Field has by many Degrees the worst Clover upon it this Year, which is a strong Demonstration of what I shall offer presently, upon the Subject of mowing Clover.—I shall now recapitulate the Use of the nine Acres of the Clover already mentioned.

R E C A P I T U L A T I O N .

Maintaining eighty-three Head of Swine, from the 24th of *May*, until the 26th of *August*, 94 Days.

Maintaining nine Horses, from the 6th of *June*, until the 29th of *September*, 115 Days.

Maintaining thirty-eight Head of Horned Cattle, from the 6th of *June*, until the 29th of *September*, 115 Days.

I shall not venture to put a Value upon this Use of nine Acres of Ground, because all such Kind of Valuations are arbitrary, depending totally upon the Customs of different Neighbourhoods and Countries; from whence were I to put a Value on the Maintenance of this Stock, for the Time already stated, one Man would as certainly think I had over-rated it, as another would think I had undervalued it.—It will be sufficient, I hope, to shew the Reader, that this Use of Clover will do much more than can be expected from it, in the Common Manner of Grazing it; and to this we are to add, the great Object of making Manure all the Summer.

I had almost forgot to mention, that besides maintaining the above Stock, I made at least eight, if not ten Loads of Clover Hay, because the Stock could not consume the first Growth fast enough.*

* A Load of Hay in *Ireland*, is four Hundred weight.

Some of my former Reports have touched upon this Practice of Pasturing Cattle, by Mowing their Food and bringing it Home to them, but that has only been in a much smaller Way with natural Grass.—At the same Time, I beg the Reader will not imagine I claim this Practice, as arising totally from an Idea of my own; what led me to it was, the having frequently conversed with Gentlemen, who have had repeated Opportunities of examining the Husbandry, and Manner of maintaining Cattle in *Flanders*, (a Country I wish much to see) where I am told, it is a very unusual Thing to see either an Horse, Cow, or Bullock, Grazing there at large in the Field, but they are all fed in the House, in the Manner I have already mentioned.—Upon first hearing of this Method, I was so struck with the Utility, and true Oeconomy of it, that I have been anxious to put it in Practice: I have now done so, more or less for three or four Summers, and I have so much Reason to be satisfied with it, that I cannot sufficiently recommend it to the Practice of the Gentleman and Farmer.

The Farmer who does his own Business, by the Assistance of his Children, will, for any Thing I know, be more willing to enter into this Practice, than many others, because one Month, nay one Week will shew the Profit, Advantage, and Convenience of it; whereas, the Servants of the Gentleman, will go more reluctantly about so new a Business, because it will frequently break in perhaps, half an Hour upon the sluggish Evening, to their great Mortification; and at that very Time, the Eye of the Master, or some trusty Person, will be highly necessary; otherwise shameful Waste will be made, for want of five or ten Minutes careful Raking of the Clover or Grass. And it will not be an unprofitable Caution to have the Scythe brought Home every Evening; for Carmen and many others can Mow a few Sacks full, though Mowing is not every Labourer's Business in *Ireland*.

It should seem hardly necessary for me to mention, that where a Field under Clover, shall be intended for this Species of Rural Oeconomy, that it will be absolutely necessary to pick off all the Stones which may happen

16 Some Account of the Summer Maintenance

happen to be upon the Land *, otherwise the Scythe cannot work close to the Ground.—And the Farmer never made a truer Observation, than when he said to his Mowers, “Cut close Boys, for one Inch at the Bottom, is worth two at the Top.”

The Danger to which Horned Cattle are liable, by eating Clover, how prevented, and how removed with Safety, when they are diseased.

Farmers in general, are pretty well informed of the Danger to which Horned Cattle are liable, from their eating Clover, by its Hoving them. This unfortunate Circumstance, may deter many from the using Clover in the Manner already mentioned ; I am therefore to shew the Means of avoiding the Danger.

And therefore, when they begin to use the Clover, it should be mowed two or three Hours before giving it to the Cattle ; begin the Business in dry Weather, and give it them sparingly in the Commencement—a few Days will render any further Precautions unnecessary, because it may be mown and brought Home immediately to Fodder with, even when Wet, until the second Growth begins to be fit for Cutting ; and then a little Caution will be again required, and that more particular-

* It has been an Assertion, that by taking the Stones off some Land, it has proved unprofitable, until the Stones have been restored.—This I readily believe ; but like many Events from Local Causes, this Notion I find has diffused itself to much greater Extent, than the like Effect will be found. I am of Opinion, this Effect can only happen, where the Species of Stone, from its Alkaline Quality, has a powerful Attraction of the Acid floating in the Atmosphere ; which, from the imperceptible Ebullition excited by their Union, throw continually, small Incrustations, or Flakes off the Stones. Such a Species of Stone I would not remove. But they are very rare. I once saw this Kind of Stone upon the Verge of Oxfordshire, not far, I think, from West Wycomb.

ly,

ly, if the Weather be moist; and also, when the Clover is too short for Mowing, it will be proper to be cautious in turning the Cattle in, to graze but for a short Time in the Beginning, and that when no Rain or Dew is upon the Clover; for it is the *Youth* or *Softness* of the Clover, and Rain or Dew upon it, which are productive of the Disease, when the Cattle, in their first feeding upon it, are allowed to eat too freely of it. And it is very remarkable, that I tried some of my Cattle with mown Grass, and mown Clover, and they rejected the Grass for the Clover, because, I presume it is sweeter and more juicy; that Juiciness is the very Thing, as I conceive, which generates the Air, to the great Annoyance and infinite Danger of the Beast. These Matters being attended to, the Necessity of any further Care ceases, unless upon a Change of Pasture, and then to Clover again; in that Case, I conceive the like Precautions should be observed.

I speak of these Precautions from Experience; for it may be remembered, that in the Year 1764, I lost a Bullock by his eating Clover.—And last Summer, I had one Bullock much diseased from the same Cause; and also another Bullock and a Cow, from their eating young Lucerne; all from the Carelessness and Disobedience of Servants, who imagine they know Things and Consequences better than any other Persons whatsoever. However, I happened to be at Home upon both these Occasions, and had the Remedy in my own Hand. I stabbed them all three, according to the Method, related in my Report for the Year 1764.—A Method so easy, now so familiar to me, and attended with so much Safety, and speedy Relief, that if I had five hundred Head of Cattle diseased in that Way, I should not fear the losing one by the Operation.

One of the Plough Bullocks, which I saved by Stabbing last Summer, was the very Fellow that was in the Cow's Belly, which I saved in the Year 1764, when she was diseased in the same Manner, as related in my Report for that Year: And what seems to prove the inoffensiveness of this Method of Cure, namely Stabbing; this Bullock was stabbed about seven o'Clock at Night,

B

and

18. Some Account of the Summer Maintenance

and was Ploughing all the next Day, with as much unconcern, as if he had not been diseased or stabbed at all *.

This Bullock however, in the Operation (he being a large strong Beast) gave me a Kick which knocked me down, and rendered me incapable of standing for some Time. That other People may not meet with the like Accident, I recommend to them, that they stand with their left Side, close to the left Shoulder of the Beast to be relieved, laying the left hand upon the Back of the Animal, and with the right Hand, perform the Operation in the Part, and with the Knife disposed, as described in my Report for the Year 1764.

The Cow which I stabbed the same Evening as this Bullock, required the Operation to be performed three or four Times, before she was perfectly relieved; so rapid was the Rarefaction of the internal Air: But at length the Swelling abated, and she was very well afterwards; save, that the repeated Wounds, festered a little, and required a few Dressings of Turpentine, and the Yolk of an Egg mixed.

These Operations, upon these Cattle, was performed with a small double edged dissecting Knife. The Cow requiring repeated Wounds, convinced me that the Knife was too small; and no Shoulder to it, there was very probable Danger of my letting it slip out of my Hand, into the Body of the Beast; and indeed I wonder I did not do so, when the Bullock gave me so violent a Kick.—These Considerations induced me to think of having a Knife made on purpose for this Business; of which I accordingly cut out a Pattern in Paper, and Mr. Read in Parliament Street, Dublin, executed it for me in a very compleat Manner, by whom any Gentleman or Farmer may be supplied; and I think no Man who grows Clover ought to be without one of them.—For Description of the Knife, see Plate.

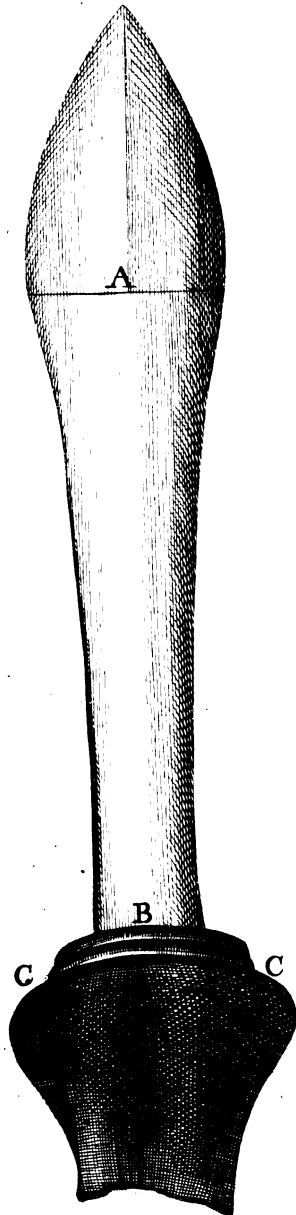
With

* Since finishing this Report, I have stabbed this Bullock, twice in a Fortnight *this Summer, 1770*, and we cannot tell the Cause of his Swelling; he is now very well, and was worked in the Plough the Day after being stabbed.

From A to the Point, the Knife is as sharp as a Lancet. —From A to B, the Shank gradually swells and does not cut at all, but has a round Edge on each Side, that it may not cut, in withdrawing the Instrument.

C C. Into, or upon the Shoulder of the Handle, screws an hollow Socket or Case, that, and the Handle both of Lignum Vitæ. The Handle five Inches long.

The Blade is also five Inches long, and when used, is sent quite home to the Hilt.



With *this Knife* I stabbed the *second* Bullock which I had hived last Summer. Half an Hour had not elapsed, before the Boy who used to drive him in the Plough, came running to me with the Ploughman's Phrase, who was helping to drive the Bullock about, crying out, "Sir! Sir! the Bullock is bursting!"—I ran to him, not being at the Time above twelve or twenty Perches off, with the Knife in my Pocket. The Man told me the Bullock had fallen down, not being any longer able to move.—Observing no Wind to pass the Wound; without Hesitation, I passed the Knife into the same *external* Orifice, and so into the Paunch, or great Receptacle of the Intestines, when the Quantity and Impetuosity of the Air which rushed out was astonishing.

The Distress of the Beast, at this second Time of my seeing him, was truly pitiable; his Tongue hung out of his Mouth, his Eyes full, as if they would have started out of his Head, his Rectum distended externally, at least five Inches, and his hollow Groans such, as would move Inhumanity itself.

This second Operation being necessary, requires some further Explanation.—We have seen, that although the Bullock was stabbed, yet, that he grew worse, insomuch, that a second Operation was necessary.—Looking at this Consequence superficially, may induce one to imagine, that stabbing will not afford the expected Relief.—But it will as certainly do it, as wounding a Blood Vessel will be productive of the Emission of Blood.—But, as I conceive, here is the Cause:—When the Bullock came to move about, that Motion had altered the Position of the *internal* Orifice, so that the Air could not pass with the same Rapidity, with which it rarified internally, and when the Bullock fell (or lay down, I am rather willing to believe) the internal Orifice was still more removed from it's opposite Position to the external one, and consequently no Air could pass the Wound, and therefore the Disease must inevitably increase every Minute with great Rapidity; and thereby, also contribute to moving the internal Orifice farther from the external one.—But the Moment another Puncture was made in the Paunch opposite the external one, we see the Air rushed out, the Beast got

well, and was I think, ploughing all the next Day. Whereas, had not the second Wound been given, I am persuaded he would have died in ten or fifteen Minutes.

In performing this Operation, there is one Circumstance, which I must not omit to recommend to the Attention of those who may have occasion to practise it. That they are careful not to enter the Knife too near the Hip-bone, which may be easily done by the Deception which the Flatulency excites; for the Beast, when diseased, is so distended, that the Operator may be deceived; the Position of the Hip-bone, not being so apparent as one would imagine.—I therefore recommend the feeling for the Short-ribs before the Puncture is made; they being found, pass the Knife as near the Center as may be, between them and the Hip-bone.

I mention this Circumstance thus particularly; because, in stabbing the Cow already mentioned, I made the Wound too near the Hip-bone, which I suppose wounded the Vessels, and Verge of the Muscles adjoining to it; by which Means the Cow bled, I suppose not less than three or four Ounces: Were that all it would be of no moment; but to the improper Position of the Wound, I attribute in some Measure, the Festering which ensued: Whereas, the Bullocks did not bleed half a Tea-spoonful, their Wounds never festered, neither did they require any Thing to be done to them, save that of rubbing on a little Tar to keep off the Flies.

I have been thus particular in relating these Operations, because I am now writing upon the Subject from Experience; when I entered upon it in the Year, 1764, I wrote from Supposition, and Information; and whoever may wish to know the Method perfectly, must consult the Report of that Year, as well as this.—But as the most effectual and speedy Method of diffusing the Knowledge of this Practice through the Kingdom; if ten or twenty Gentlemen of different Counties, Members of the DUBLIN SOCIETY, will do me the Favour to spend a Day here, any Time after the Middle of May, and before August, I will, before them, without hesitation, turn a Beast or two in perfect Health, into my Clover,

ver, and swell them on purpose, to shew them the Operation of stabbing, and it's effect.—Should such a Company as this be formed, Gentlemen will be so kind as to give me a few Days Notice, that I may be sure to be at Home, to answer their Expectations, and my own Wishes ●.

I shall

* When I delivered this Report in Manuscript to the Society, I mentioned this Invitation, as it might be some Time before they would be otherwise apprised of it, and thereby the Season would be elapsed.—The Society seemed to apprehend a Doubt, whether the Number of Gentlemen I had named, could make it convenient to visit me together; I therefore, instantly gave up that Limitation, which I only intended to be more diffusive of the Remedy in Question.—The Society accordingly, issued an Advertisement, by which, all Persons were invited to come to my House on the 12th of June.—The following Letter from me to the Society, will explain the Event.—

To the Vice-President of the DUBLIN SOCIETY in the Chair, on Thursday the 14th of June, 1770.

SIR!

In pursuance of the Advertisement which the Society issued, in relation to the Method which I practice, to save horned Cattle when swelled by Clover, or any other Cause; sixty, or seventy Gentlemen, Farmers, and other Persons came here yesterday to see the Operation.—Accordingly, about one o'Clock, I turned a young Bullock into my Clover, he not having tasted any before this Summer; and, in order to increase the Danger, I had him kept Fasting from seven o'Clock the Night before, until he came to the Clover.—The Bullock swelled, I stabbed him in Sight of all the Persons present—He was suffered to eat so much of the Clover, that it became necessary to stab him a second Time, which was also done in the Presence of several Gentlemen, and some Farmers, who were not gone away, and this Morning the Bullock is perfectly well.—Before the Beast was turned out, I explained the Manner of performing the Operation, as clearly as I was capable, to every Person present.

A Shepherd came on Purpose with the inclosed Letter, from Mr. North, below Mullingar.—One Gentleman was here from Carlow, and some Gentlemen, several Farmers, and other Persons from the Counties of Kildare and Dublin.

I hope

I shall now resume the Subject of mowing the Clover, and bringing it Home to Pasture the Cattle, in order to shew the

I hope, Sir, this Event, will in some Degree, diffuse the Knowledge of this useful Operation, but, by no Means so extensively as I hoped would be the Case, from the Expectations I had of several more Members of the Society of different Counties being here.—However Sir, as I wish to render myself as useful as I can, I shall be ready at any Time to repeat the Operation, or to do any Thing else in my Power to diffuse the Practice of it, in such Manner as the Society may think most proper.

I am Sir,

Loughlinstown,
June 13, 1770.

Yours, and the Society's,
Most obedient humble Servant,
JOHN WYNN BAKER.

That Passion which so powerfully moves the contemptible Part of human Nature to Detraction. often blinds them against their own Interest: The present Case affords a striking Instance of it.—On the 11th of October last, I had the Pleasure of visiting an ingenious Friend or two, in the Neighbourhood of *Castle-Knock*, and who were present when the Operation before us was performed; and they informed me it was reported in that Neighbourhood, that the Bullock which I stabbed on the 12th of June, had died of the Wounds I had given him on that Day.—Many other Accidents might have happened since that Time to kill him; any one Wound have been attributed to the Operation.—However, it happens, that the Bullock is come to Life again, like many a Gentleman who has been killed in the News-papers; and is now November 10th 1770, as well in Health as I can wish him to be, although he has been handled pretty roughly, in preparing him for Work this Winter.—He is so remarkable a Beast in his make, that every Man present on the 12th of June, might easily know him again, even amongst a thousand.—I might happen to have sold him, as I did another which I stabbed three Times in the past Summer; in that Case I could not perhaps, have proved his present Existence; but in Order, further to shew it, if the Dublin Society thinks it worth While, I will repeat the Operation upon this same Bullock, next June; and for that Purpose, I hope they will again invite the Publick.—On my own Part, I shall only remark, that if all Mankind were as ungrateful Scoundrels, as those who propagated this Falshood with some others, that no honest

the Advantages which will arise to the Landholder, and therefore I shall recapitulate them as follow.

Recapi-

honest Man ought to bend his Attention to their Service or Instruction, but to let them remain in that Corruption and Ignorance, which such alone deserve to be involved in.

In Consequence of the Society's Advertisement, another Remedy appeared in the News Papers of Dublin.—I have mislaid the Papers, otherwise I would insert that Remedy here, not that I think my Readers will have any great Loss; besides which, it is to be presumed, that such Persons as thought favourably of it, were careful to preserve it.—However, in Consequence of this Remedy appearing in the Papers, I thought myself in some Measure called upon to give it the fairest Trial, and therefore, after the Business of the 12th of June was over, I took the Liberty to trouble one of the News Printers with a letter to the following Effect.

SIR,

I am well pleased to see in your ———, that the Notice, which the Dublin Society gave in yours, and other Papers, of my Invitation to the Public, to come and see the Method which I practise to save Cattle, when swelled by Clover, or any other Cause, has been productive of another Remedy being communicated to the Public; and as I am persuaded, their Service, was the only Motive of your Correspondent, for sending you Dr. Rowley's Method of Cure, I am induced to hope he will confirm the Merit of it, by taking the same Method, to show the Public, how certainly that Remedy may be depended upon; as I have done, with the one which I shall practise, until I am acquainted with a better; and therefore, for the fuller Information of Mankind, I invite your Correspondent, to turn a Beast of his; or twenty, if he pleases, with an equal Number of mine into Clover, and to let them remain there an equal Time, his to be cured by Dr. Rowley's Method, and mine, by the one I practise.—Upon such a Trial, which ever Method shall first afford Relief to the Cattle, will certainly be that, which we should recommend.

I was induced to invite the Public to see the Remedy which I use, from hearing, that a great Number of Cattle are lost every Year by the Disease before us; as I hope thereby to diffuse the Knowledge of so simple an Operation through the Kingdom.

Recapitulation of the Advantages arising from mowing Clover and other Grasses, to Pasture a running Stock at Home.

1st, Great Quantities of Dung are made thereby, all the Summer.

2d, A much larger Stock will be maintained upon the Produce of a small Quantity of Ground, than can be upon double, or I believe treble the Quantity, in the ordinary Way of pasturing them.

3d, The Cattle are secured from Rambling, and Thievery.

4th, Your own, and your Neighbour's Crops are secured from any Injury, by Trespas.

5th, And above all, the Profit, which such a Practice affords.

Let.

Kingdom. If Dr. Rowley's Remedy shall appear to be preferable, I shall at least have the Satisfaction, of having been instrumental to his Remedy being made more public than it was before, as I own for one, I am not acquainted with that Gentleman's Writings.

Many Remedies are offered, in several Books, and one in my Report for the Year, 1764, which occurred to me that Year, and which saved the Beast then diseased: But in general, internal Remedies, either by the Mouth or Injection, take up too much Time in their Preparation; and Expedition in affording Relief, is of the first Importance in this Disease, as will appear manifest to every Man, when he shall suppose a large Number of Cattle to be swelled at one and the same Time: A Case, which we may suppose to happen frequently.

I am informed of a Man in the County of Dublin, who lost seventeen fine Cows in an Hour last Summer by this Disease, one with another, worth 7l. a Cow.—A poor Woman in my Neighbourhood had but two in the World; I am told she lost them both in half an Hour, by their slipping into a Gentleman's Clover, and I hear of several Cattle lost this Summer.

1764

Many

Let me anticipate Objections.—It may be urged, “there is the Expence of Mowing, and bringing Home the Clover or other Grass.”—Admitted.—“There is the Injury you do the Land, by mowing and carrying off the Clover.”—Not to clear a Case, as is imagined.—But for the first Objection.

The Expence of mowing, and bringing Home the Pasture is something; but by no Means so great as one would imagine.

Many such Events happen, to the great Distress of Individuals, and manifest Injury of the Community; and therefore it seems highly incumbent on every Man, to use his best Endeavours to communicate the most effectual Remedy he is acquainted with.—All I wish for is, that the safest, and most expeditious in Nature, may be thrown into the Hand of every Peasant in the Kingdom; if it were; Clover would be more cultivated than it is, and my End fully answered.

Salt and Water I gave to a Bullock twice this Summer within ten Days at the Time of making the Incision, which I repeated each Time he swelled; and his Swelling did not arise from Clover, but from some other Cause unknown to me.

The Vulgar say, that the Cattle some Times take up a Snail with their Grass, and that the Snail will swell them: A Circumstance, which I can neither confirm nor confute.—But certain it is, that some Cattle are more apt to swell than others,

I am Sir,

Loughlinstown,
June 1770.

Your very humble Servant,
JOHN WYNN BAKER.

As this Letter did not appear in the News Papers, I presume it was not thought to be a Subject of Moment enough, or what is more probable, Room could not be spared to insert it.—I therefore give it a Place here, still as an Invitation to the Person who favours Dr. Rowley's Method, to compare the Merit of it, with that of the Knife, and he shall name the Number and Kind of Cattle himself, if he pleases, upon which we shall make the Trial. And if the Gentleman shall be inclined to support the Merit of that Remedy, I will be at the Expence of advertising, to invite the Public to see the two Remedies put in Practice, upon at least, I hope, twenty Head of Cattle, at one and the same Time.—And I wish him to choose the following Kind of Cattle.—Milking Cows, forward in Calf.—Plough Bullocks, and Calves of a Year old.—Let him turn these or any other Kind into Clover, they not having had any before for the Season, and I will turn in as many of the same Kind.

imagine.—A Man, in a very little Time, will mow sufficient for fifty Head of Cattle. The Ploughmen and Boys unyoke about five o'Clock, and go away to the Field with the Carriages, in order to bring Home the Food, that being ready mown to their Hands; and when the Clover is good, it is not to be conceived, what a small Quantity of Ground will furnish six or eight Loads. —For the Morning Foddering, the same Cattle bring Home what is wanting, if the Redundancy of the Evening has not been sufficient. So, that in Fact, there is scarce any other Charge extraordinary, than a Man to mow the Clover, clean out the Houses, and attend the Foddering, &c. for I need not tell the experienced Farmer, how little the Ploughman and Boys will do, after unyoking the Ploughs, if they can help it. —The Expence of this extra Man, is amply repaid, by the Dung which is made in this Way. The Circumstance of little Ground maintaining a great Stock, will be, by all the Difference of the Ground the same Stock would require to run over, a clear Saving to the Farmer. We may therefore truly say, that by a little Addition to, he actually much diminishes his Expence, enlarges his Stock, obtains Materials for improving his Farm, increasing his Produce of Corn, and diminishing his *unprofitable* Payment of Rent.

I come now to the second Objection, “That mowing the Clover, impoverishes the Ground.” —This requires some Consideration. —I was once strongly of this Opinion, inasmuch, that I looked upon it, as a barbarous Piece of Husbandry. —But I have exploded that Opinion for some Time. I am aware, that the generality of Mankind will start at this, and pronounce me a mad Man, as many have done before. However, patient Reason will attend. —My offering an Opinion, binds no Man. My Duty is to tender to the Public, for the Honour of my Patrons, the general Service of Mankind, and my own Credit, my best Judgment and Experience. —And by some late Reading, I have it in my Power to bring in Aid of this Change of Opinion, the Sentiments of some Writers of no small Credit, and the Experience of Farmers of no little Practice.

When

When the Barley or Oats, upon which Clover has been Sown, " is carried off the Ground, the young Clover must be reserved, and not injured, by turning Sheep, or any Sort of Cattle, to eat it up, as is but too commonly practised : * And it may do good Service in the Spring, to load a Bundle of Thorns with a good Weight, and to draw them once in a Place, over the young Clover, and then to give the Ground one rolling.—It is of *Consequence* to the Ground, to determine to *mow* the Clover, through the Year, instead of seeding it down, at any Part of it, by any Sort of Cattle : † For, by this Method of twice mowing the Clover, the Roots grow to a much larger Size than by turning in the live Stock, and the larger the Roots, the more Nourishment there will be for the Crop of Wheat which is to follow : Besides, the second Crop of Clover will be larger, than when the Clover is first eat by Cattle, as the visible Part always bears a just Proportion to the invisible Part ; that is, the Size of the Plants, above Ground, is large, if the Root is large, and slender, if the Root is slender ; and the latter does not come to Perfection, if that Part, which should be the Body of the Plant, be destroyed, as is the Case when eat up as soon as there is a full Bite of tender Plants. The Roots of the Clover, when the Ground is ploughed into Seed furrows for the Reception of the Wheat Seed, begin a fine Fermentation ; and then two good Effects follow.—One is, by this Means, the Earth is made fine, by this Putrefaction, which agreeable to what has been said, has the Power of Ploughing, or the Force of mild Dung ; by both which the Mould is divided

* It is not quite clear to me, that if Horses or Sheep be turned in after Harvest, *only* when the Land is *perfectly Dry*, and that they are not kept in too long, so as by abatement of Pasture, they bite the Heart of the Clover, that any Injury will arise to the Crop ; for all the Growth which shall be found upon taking off the Corn, or that shall succeed before Winter, will disappear with the first Frost ; and therefore I should imagine, it might as safely be eaten, the Precautions before mentioned, being adhered to.

† Admitting the Clover twice mown in a Season, there will be a very pretty Growth after the second Mowing, which I would certainly graze, notwithstanding the Sentiments of our Author.

ded into lesser Parts : The other is ; the Roots, during their State of Motion, or Fermentation, supply the Loam with the kindest Nourishment, the chymical Principles of Vegetation, mingled, in a well regulated Proportion, by the benevolent Hand of Nature ; neither too much, nor too little of any one requisite Ingredient, but all exquisitely well adapted to carry on the Designs of Providence, in the wonderful Œconomy diffused throughout the vegetable World. Nor are the offal Parts of the Clover, above Ground, an inconsiderable Service to the Loam, for these cast off Excrements are also replete with nutritive Spirits, and proportionably help forwards with Fermentation, when these Excrements are turned into the Ground with the Plough : And indeed, the Benefit which the Soil receives from the Dews, and fine Showers, when there is a full Crop of Clover standing, is very considerable ; for then, like the fleeting Vapours which stream against the Tops and Sides of Mountains, the Dews are collected, by the spreading Branches of the Clover, and thrown into a State of Attraction, and plentifully precipitated to the Surface of the Ground, and there imbibed by the fine Soil, as there is a free Communication for all the lovely Operations of Nature. The Surface of the Loam, being covered with a thick Dwarf-wood as it were, is finely sheltered from the Causes which bring about Exhalation : For, in the present Case, the Loam receives the Presents of the Atmosphere, but will part with nothing back again ; and though the Rays of the Sun cannot presently penetrate, yet they afford Warmth to the Air, Rains, and Dews, which have access to the Roots ; and this Warmth, added to the Fermentation beneath the Soil, is every Way suitable to the Plants, as the Reader remembers Fermentation implies some Degree of Warmth. *—That we may convey a satisfactory Meaning, concerning the great Consequence of the larger Roots of Clover to the Ground ; arising from the Utility even of the lesser, the Reader is to consider, that a spherical Portion of a Root, of an Inch Diameter, contains eight Times more nutritive Principles, than

* The Nature, and Importance of Fermentation, so far as relates to the Farmer's Purpose: See my Hints upon Husbandry, published by Flinn, Dublin.

than a spherical Portion of the same Root of half an Inch Diameter : But as the Roots are Cylindrical, and as Spheres are in Proportion to their circumscribing Cylinders ; so that Disparity of eight to one continues ; that is, a Root of half an Inch Bore contains only the eighth Part of the fermenting and nutritive Principles, of a Root of double that Bore : Or, to express it in other Words, the Wheat is nourished eight Times better, from a Clover Lay, which has been twice mown, than from the same Ground, where those Roots have been Dwarfed, or kept to the Size of half that Bore, or full Growth of Wood ; and this is exclusive of the greater Benefit arising from the offal Parts above Ground, which are cast off by Nature, as so many Excrements, in order the better to carry on the Appointments of Vegetation." †

Thus far Mr. Randal's Reasoning, which I own I think very powerful—But now for the Practice, in further Answer to our second Objection, and in Support of mowing the Clover, when Wheat is intended to follow it, and for the greater Improvement, instead of the Impoverishment of the Land.

In

† See Mr. Randal's *Semi Virgilian Husbandry*, P. 123.

I have taken this whole Passage from Mr. Randal, because it appears to me to contain more good Sense, strength of Reasoning, and Conviction, than we often meet with in controverted Points. But I would not be understood to be an Admirer of Mr. Randal's System of Husbandry in general.—He is much bewildered, unintelligible, and mistaken in his first Principles, as to his general System,—And as to what he calls his *Semi Virgilian Husbandry*, it is a System founded upon the Labours of another, whose Genius was too vast for humble Imitation, but was made for creating.—I mean Mr. Tull, whose Path Mr. Randal seems to have followed, (though without that Respect which every ingenious Man will shew to his Name ;) yet, at a very humble Distance, unworthy of a Man of Mr. Randal's Learning.—At the same Time, there are two or three Ideas in Mr. Randal's Work, which are worthy of the highest Praise. That which I have quoted is one, and he has another, which shews a Boldness of Genius, that does him Honour, not that I suppose many have had Courage to put it in Practice. I hope to do it shortly, although I expect a general Outcry, as soon as I begin.

In the West Riding of Yorkshire, in the Neighbourhood of the Marquis of Rockingham, Mr. Young says,
 “ Clover they sow with Barley, chiefly for mowing;
 “ they cut it twice, and get three Tons of Hay at the
 “ two mowings: They find no Crop whatever to an-
 “ swer better, but some Land begins to grow tired of it,
 “ the Culture having been common these forty Years.
 “ *The Wheat they find better after that which is mown,*
 “ *than that which is fed.*” †

About *East Newton* and *Laystrop* in Yorkshire,
 “ Clover they sow with Barley or Oats, mow it twice
 “ for Hay, and get four tons of Hay at the two Mow-
 “ ings: They find it of so a meliorating a Nature, *that*
 “ *they always sow Wheat after it, even on Land that, by*
 “ *any other Management, will yield only Rye.*” ‖

“ It appears, that Wheat sown after Clover mown, is
 “ superior to that which succeeds the Crops fed. In se-
 “ veral of these Places it is the Custom to sow Oats af-
 “ ter it; this is a bad Practice, for when the Clover is
 “ fine, *Wheat may almost universally succeed it.* Witness
 “ the poor thin Rye Soils at *East Newton*, converted in-
 “ to Wheat ones by this Grass.” *

The Reader will doubtless observe, that all which has
 been said, tends to prove, that a better Crop of Wheat
 will be obtained from a Clover Lay which has been
twice mown, than from that which has been grazed; it
 must therefore follow, that the Ground is left in better
 Condition, after *Mowing*, than after *Grazing*.—I hope I
 may therefore dismiss our second Objection, as being fal-
 ly answered.

But further as to the State of the Ground: I observe
 it is left cleaner, and much freer from Weeds, Couch,
 and other Grass, after *Mowing*, than after *Grazing*, as I
 fully experienced in the Piece of Ground before us; for the
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† See Mr. Young's six Month's Tour, Vol. I. P. 245.
 London Edition.

‖ See Mr. Young's six Month's Tour, Vol. II. P. 58.

* See ditto ————— Vol. IV. P. 313.

the two Acres, of which I grazed the first Growth with my Horses, as already mentioned, was soon, and is still pretty thickly covered with natural and couch Grass, whereas, upon the Part which was mown, there is scarce a Tussock of natural Grass to be found.—This very material Difference is worthy of some Notice.—Turneps, Rape, Clover, and every other Plant, which extend their Leaves in such a Manner as to prevent the Rays of the Sun from reaching the Surface of the Earth, and whose Leaves first attract, and then cast off the Rain and Dew in drip upon the Surface of the Earth, I conceive thereby destroy, or at least prevent the Growth of natural Grass, and Weeds; but where those Plants are kept down by Grazing, the couch, natural Grass, and Weeds, immediately make their Appearance, which not only renders the Land not so fit for the Reception of Wheat, as when the Surface is not infested with them, but will greatly annoy the Wheat in it's Growth.

The Observations offered since the Dismissal of our second Objection, lead to another very important Piece of Information: That of converting Land under Tillage, into Pasture, or Meadow, speedily, at a moderate Expence.—It is pretty generally known, that if Tillage Land be not in very high Condition, it will afford but very indifferent Pasture the first Year after sowing the Seeds of natural Grass upon it, and therefore I should conceive it would be a good Practice to sow red Clover with the Grass Seeds, for the Purpose of Grazing the Clover for two Years; during which Time, I have no Doubt, but the Growth of natural Grass will very well cover the Land, but this is expressly, in Case the Clover is grazed, whereas, if it should be suffered to stand for mowing, I should expect, for the Reasons already mentioned, it would in a great Measure, if not totally destroy the natural Grass.

I have dwelt much longer upon this Subject of Clover than I intended; for the sake of the common Farmer in *Ireland*. He seems to have no Idea (at least none of those with whom I have conversed) of it being possible to obtain a good Crop of Wheat, at one Ploughing, from a Clover Lay. But in *England*, it is a common and successful

cessful Practice; and we see from undoubted Authority, that the Wheat is the better for the Clover having been mown.—Why this Practice should not succeed in Ireland, I see no Reason to imagine, unless the Clover be sown in Ground not able to produce it, or in so slovenly a Manner, that it cannot come to any Thing.—* We see that the Rye Land about *East Newton* in Yorkshire. has been brought to produce Wheat, merely by the Use of Clover.—Upon the Whole, I hope Gentlemen will at least try the Experiment, by putting this Method in Practice, and thereby set the Example to Farmers. who perhaps may be the readier induced to attempt it, should it succeed, because the simplest Operations, attended with Profit in the Clover Hay, or soiling of Cattle, the saving a Years Rent of the Ground, three or four Ploughings, and as many Harrowings, in the manufacturing Fallow, are Circumstances of very great Moment to the Farmer—of no less, than a saving of three or four Pounds an Acre upon Wheat.—But I must add, that if the Farmer can, by any reasonable Means, give a Winter Dressings to his Clover, after taking off the Barley or Oats, in which it has been sown, he will find an abundant Profit thereby, in his Clover and Wheat.

And now, that I have touched upon this Subject of Manuring, I shall trouble the Reader with a Method, which will in general afford *two* at least, and in some Places three good and plentiful Dressings to the same Field; at the same Time, in preparing his Manure, he will be amply paid by a most plentiful Crop of Potatoes, increase the Dimensions of profitable Ground in his Field, render his Fence impregnable, and check that wanton Latitude, which, to my Astonishment, in Kingdoms boasting Liberty,

* As I saw Yesterday, upon the Farm of a Gentleman, who last Spring paid thirteen Pounds for Clover Seed, which he is told was sown upon a Field of twenty-five Acres.—I rode with him Yesterday over the Field (May 13,) and indeed it is scandalous to see how he has been imposed upon.—I am sure I have twice as much Clover now upon four Acres, as he has upon his twenty-five Acres. When this is the Case, no Man will attempt to sow Wheat after it.

berty, Freedom, and Security of Property, Sportsmen take in galloping over our Fields, and breaking down our Fences *.

It

* However, to do Justice to Gentlemen Sportsmen, I must say they are in general, much more careful than their Servants ; for the wanton Mischief, and insufferable Insolence of those high fed Beggars, when mounted upon their Masters Hunters, renders the Gentlemen's pack of Hounds, a Nuisance, equally shameful, when he is not with them; with the inganious Institution of Club Hounds, now pretty generally established, for the Amusement of Tinkers and Taylors, Coblers and Apprentices. Of this lovely Crew, I have had threescore at a Time, tearing over my Wheat, on St. Stephen's Day :—And this is Liberty !—Oh Farmer, collect thy Patience, for indeed thou hadst need of more than a Man's Share.——I wish Sportsmen of every Class of the hunting Tribe, would adopt the Sentiments of the great and good Sir Thomas Moore, who, in his Scheme for a Mode of Government, sufficiently shews his Abhorrence of this Practise.—

“ What Pleasure can one find in hearing the barking and howling of Dogs, which seem rather odious than pleasant Sounds? Nor can they comprehend the Pleasure of seeing Dogs run after an Hare, more than of seeing one Dog run after another, for you have the same Entertainment to the Eye on both these Occasions, if the seeing them run, is that which gives the Pleasure, since that is the same in both Cases. But if the Pleasure lies in seeing the Hare killed and torn by the Dogs, this ought rather to stir Pity, when a weak, harmless, and fearful Hare, is devoured by a strong, fierce, and cruel Dog. Therefore, all this Business of Hunting, is among the *Eutopians* turned over to their *Butchers*, and those are all *Slaves*. And they look on Hunting as one of the basest Parts of a Butcher's Work : For they account it both more profitable, and more decent to kill those Beasts that are more necessary and useful to Mankind ; whereas, the killing and tearing so small and miserable an Animal, which an Huntsman proposes to himself, can only attract him with the false shew of Pleasure, for it is of little Use to him. They look on the Desire of Bloodshed, even of Beasts as a Mark of a Mind that is already corrupted with Cruel-

C

ty,

It is a universal Consequence, where Fields have been long under Tillage, that the head Lands rise to a great Height from the Lodgments of Earth, by the frequent Turning of the Plough, by which Means, the Water is confined upon the Field, frequently, to the great Injury of the Ground, and Annoyance of the Crop, whatever it be — The Ditches we have in general upon the Farms of *Ireland* are made deep and wide, and consequently afford a large Quantity of Earth, to frame the Back of the Ditch; and therefore, this Back, extends into the Field, six, eight, and sometimes twelve Feet; and thereby, affords the most commodious, and desirable Footing, for the Feet of Hunters, to the great Annoyance and Injury of the Farmer.

Where you have a Field thus circumstanced, which is under Pasture, Meadow, Clover, or preceeding a Fallow, mark out by a Line, (or if the Ditch be crooked, use your Line only to the internal Trench next the Body of the Field) Ground for three Ridges of Potatoes. according to the ordinary Custom of the Country, * the three Ridges and Trenches together, making 24 Feet, from the internal Verge of the Back of the Ditch.—Let this Ground be highly manured with Dung, (on my Ground, I lay it three Inches thick) in the liberal Use of which, I recommend more Attention being paid to the enriching the Compost, (for such I consider this Preparation) than the Object of obtaining the Potatoes, though that is a desirable one.—However, if the Land be naturally good, and

“ ty, or that at least by the frequent Returns of so brutal a
“ Pleasure, must degenerate into it.” Eutopia.

“ I hear the Tumult of the distant Throng :

“ *Here*, like a Shepherd gazing from his Hut,

“ Touching his Reed, or leaning on his Staff,

“ Eager Ambition's fiery Chace I see ;

“ I see the circling Hunt of noisy Men.

“ Burst *Laws Inclosure*, leap the Bounds of right,

“ Pursuing and pursued, each others Prey,

“ As Wolves for Rapine, as the Fox for Wiles.”

Night Thoughts.

* I mention three Ridges. In some Fields, two, and one may be sufficient, particularly where the Field is already laid under Meadow.

and the Dung be used as plentifully as I use it, the Potatoes will be wet; nevertheless, they will be good for Swine or perhaps other Cattle; but where the Land is of a midling or indifferent Kind, the Crop of Potatoes will be plentiful, and even good, with this high Manuring.

I put this Method in Practice in the Spring of the Year 1769, my Crop of Potatoes in many Places, were of the Spanish, in the Proportion of 124 Barrels to the Acre, and of the white Munster, of the Rate of 184 Barrels to the Acre, each Barrel being 20 Stone, and all my Potatoes were very good and dry.

It should be observed, that the Spanish Potatoes are rarely cultivated by the Poor, because they do not produce in Quantity, equal to many other Kinds, but are generally preferred at the Gentleman's Table: The Produce I had of them was considered as very great, by the People who have been accustomed to the Potatoe Tillage.

My Reason for stipulating 24 Feet from the internal Verge of the Back of the Ditch is, that sufficient Room may be left for the Cattle and Plough to come fairly out, without the whole Labour being thrown upon the two hind Cattle,* and to prevent that raising an Heap again by the Plough upon the Head-land, when the Operations of Tillage are again to come upon the Field.

When the Potatoes are dug, I recommend the Ploughing and Harrowing the Potatoe Ridges two or three Times without intermission when dry, in order, perfectly to incorporate the Dung and enriched Particles of Earth, with the

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Parts

* There is yet another Method also, which contributes greatly to the Relief of the Hind Cattle in a Plough, which struck me very soon after I commenced Farmer. Suppose your Ploughs to go East and West, let them begin North and South, taking Part of the Head-land, and Part of the Field within the Head-land, and thus plough four or five Bouts at each End of the Field.—Then let the Ploughs begin their Work East and West, and the Ease with which the Cattle will come out, I am sure will please their Owner.

Parts which have not been in contact with the Dung: By this Means, the whole Body of Compost, will be in fine Condition for laying out upon the Field, in which it lies. But if those who can put this Method in Practice, can afford, at each Time of Ploughing, to lay on a moderate Dressing of Dung, the Compost, will of Course, be so much the richer, and the Field thereby improved in Proportion. The first Frost that comes, let the Compost be laid out upon the Field or Fields, in which it lies, Regard being had to the Circumstance of not cutting and abusing the Ground, and that more particularly, if Clover be the Crop then upon it.

By this Disposition of my Potatoe Tillage last Spring, I manured this Winter, *thirteen* Plantation Acres of Ground, in a most plentiful Manner, four of the Acres Meadow, and nine of them Clover.

Every Man who knows the Work of Manuring thirteen Plantation Acres of Ground, will readily conceive the vast Importance in Point of saving Expence, the having the Compost *in the Field*; and the Convenience will be increased more than double Fold, where the Field admits of this Method of preparing the Compost at *each End*, or *each Side*; because, in that Case, in Proportion to the Size of the Field, two Horses will do more Work than four, and four than eight, and eight more than sixteen, and so on: I therefore earnestly entreat whoever may adopt this Practice, that he well considers the Disposition of every Circumstance, and calculates the Execution, that all Things may conspire to the easy Dispatch, before he begins, otherwise Confusion, Delay, and unnecessary Expence will ensue. Experience makes me recommend this prudent Reflection.

We come now to the checking the Progress and Flight of Sportsmen, and increasing the Dimensions of the Field; for I have only yet described this Business to the internal Verge of the Back of the Ditch.—In that Line many Persons will find (as I did) an infinity of Stones which I suppose trickle down, upon topping the Back, when the Ditch was made.—The getting up, and removing those Stones, in order to obtain Earth for covering the Potatoes,

toes, and to compleat the whole Improvement, I am sensible, requires some Spirit and Perseverance; but when I have in some Places raised at least twenty Loads in the Course of two Perch of the Potatoe Trench next the Ditch, I hope the Gentleman and Farmer, of true rural Spirit, will not be dismayed; Perseverance will conquer Things, which at first Sight appear formidable, and when done, there is Pleasure in reflecting that we have conquered a Difficulty; which renders our Improvement much more agreeable.

When the Compost is carried off as already mentioned, it is fine dry Winter Work for the Labourers to take down the Back of the Ditch, and casting the Earth over the Surface from whence the Compost has been taken; but the *finishing* this requires some Attention, and therefore a careful Hand, with an Eye of some Taste for Uniformity, (not common indeed amongst Labourers) should be put upon the Top, with a Spade in his Hand, to dress down the Back towards the Field, with a *gentle* Declivity, leaving a Base or Platform, of about twelve or fourteen Inches upon the Top. If the Hedge has been carefully cut down, the Ditch well secured, and the Face of the Back (how can I otherwise describe it?) carefully dressed up before this Business of raking down the Rere, so much the better.—Thus, in most Fields, more Earth will be obtained, than shall have been taken away in the first Body of Compost, already described.—Upon this new made Surface, manure, and plant Potatoes, as before mentioned.

After digging this second Crop of Potatoes, which we see is upon other Ground, although in the same Place; if the Cultivator chooses to have, either Parsnips, Carrots, Cabbages, Barley, or almost any Thing that he pleases, before laying out this second Body of Compost upon his Field, he will certainly have a great Produce: But then, prior to the putting out the Compost, upon the Field, after such Crop I recommend another Dressing of Dung to the Compost, to be incorporated with the Plough and Harrow in Manner before mentioned: And where Lime agrees with Land, this is the happiest and most convenient Manner

Manner of mixing that can possibly be, provided it be spread regularly upon the Compost.

We now come to a second Necessity for some Neateness to be observed in taking off this second Body of Compost.—Our internal Line within the Field, will now be about thirty Feet from the internal Line, at the Bottom of the remaining back of the Ditch; if the Ditch be crooked, that will make the Distance in some Places more, in some less, the internal Line to the Field being *strait*.—It is thus. In loading the Compost to carry it out upon the Field, Care must be taken to slope the Surface from which the Compost is taken, gradually from the Field to the back of the Ditch, so that about two Feet Declivity may be obtained in a regular Shape. This will give a kind Drip for heavy Rains to run off, will be pleasing to the Sight, and highly convenient to the Plough, when the Field is to be continued under Tillage. If there are already none, or not a sufficient Number of Passages under the Back of the Ditch, leading into the Grike to carry off the Water when it comes to the Back of the Ditch, they must be made. To bore them will be the neatest, safest, and best Method.—It will be necessary to Manure about fifteen Feet of the Space next the Ditch, because, there the Compost has been taken off deeper, than from the remaining Part next the Field; and then convert it to such Business as the rest of the Field is devoted to.

Thus the Huntsmen are stopped, for no Man will venture to go over such a Place, the Surface of profitable Land in the Field greatly enlarged, this Addition being obtained in the extreme Bounds, of some Fields all round, in others, on each Side, and one End, and in most, at both Ends, makes an Addition not to be conceived, unless it was measured; and although the Number of Acres upon a Farm, all finished in this Way will be just the same, yet the Acres of profitable Ground will be greatly increased.

Any Gentlemen or Farmers, who wish to see this Business in Practice, will afford me Pleasure in calling upon me, when I will shew them several Fields under this

Course

Course of Management, and so well pleased am I with my first Attempt, that should I remain here, I intend to go through my whole Farm in the same Manner. I have a third Body of Compost now under Potatoes in a Field, even at the End where the *Ditch* is, because the Plough comes out at that End.

It now becomes necessary for me to give a Caution however, in putting out this Compost upon Clover, which the Experience of this Winter presented to me, from a Mistake of mine.—I laid the Heaps very close together upon the Ground, and finished putting out the Compost before I spread any of it: The several Interruptions by bad Weather, delayed this Part of the Business for some Time, insomuch, that the Heaps, by their own Gravity, and heavy Rains, became pretty much consolidated; When we came to spread them, I observed a Difficulty in taking up the Stuff, close to the Ground with the Shovels, by which Means, the Instrument cut off some of the Heads of the Clover, and the long lying of the Heaps injured some, and destroyed others of the Plants, insomuch, that my Clover is very thin in the Spots where many of the Heaps lay. I therefore recommend to those who shall thus dress Clover-land, that they spread the Compost as fast as it is laid out.

Upon the Whole, I shall conclude with observing, that I conceive this Use of the Potatoe Tillage, to be the most advantageous that can be devised, until a Farm can be gone over in this Manner, which will be a Work of some Years, where the Farm amounts to two or three hundred Acres, and therefore the Resources for making this Kind of Compost are really very considerable, although great Industry will in Time exhaust them.

I shall just add, that I was led to this Practice by mere Accident. Some of the Earth of a Potatoe Ridge was accidentally scattered upon the Verge of a poor Meadow; the Luxuriance of the Grass surprised me, but recollecting the Accident, I was no longer at a Loss for the Cause. The Effect was so great, that I immediately bent my Attention to the considering how I could most advantageously avail myself of the Hint.—How I acted, I have

I have laid before the Reader; if it shall prove advantageous to any one else; I shall have a double Pleasure in having communicated it.

Comparative Experiments, upon different Kinds of Turneps, sown in alternate Rows with the Drill-plough, in order to discover which will be the most profitable for the Farmer and Grazier to Cultivate, for the Purpose of Pasturing Horned Cattle and Sheep in the Winter.

In my Report for the Year 1768, I gave an Account of some comparative Experiments, upon different Kinds of Turneps, and therein promised to repeat the same Experiments, as one such Set of Experiments could not be absolutely conclusive, as to which Kind of Turneps are to be preferred, for the Purposes of the Farmer and Grazier; I am therefore, here to give the Account of this comparative Experiment for the second Year.

The Turneps I cultivated were of the same Kinds as last Year, and contrary to my Intention, I have continued the Green Turnep, because some Gentlemen have expressed an Opinion, that my rejecting it upon only one comparative Trial, would be too sudden; that I ought at least give it one more comparative Trial with the other Kinds. The Yellow I proposed to continue another Year, for another Reason, which I shall mention in it's proper Place.

The Kinds cultivated then in the Year 1769, stand in the following Order,

- N^o. 1. The Red or Sheep Turnep.
2. The White Tankard Turnep.
3. The Yellow Turnep.
4. The White Norfolk Turnep.
5. The Green Turnep.

These

These Turneps were all sown upon about three Acres of Ground, which had produced Potatoes in the Year 1768, according to the ordinary Method of the Country. The Turneps were sown with the Drill-plough in alternate Rows, on the 14th of June. They were thinned by Hand, and Horse-hoed regularly, as hath been often described in my former Reports, and therefore I need not repeat those Operations here. The Expence of thinning and horse-hoing Turneps, have also been ascertained in my former Reports, which renders it unnecessary for me to repeat those Circumstances in this Place, particularly as those are not now the Objects of Enquiry, but only which Kind, of the many Species of Turneps there are, is most worthy the Attention of the Farmer and Grazier. This Point then, I shall proceed to lay before the Reader, as far as the two last Years, in which I have been upon this Inquiry, will admit of Information.

On the 8th of January, I attended in the Field, to see a Row of each Kind, immediately adjoining each other taken up, and as they were loaded into the Carts, they were drawn Home to the Scales, and the Weight of each Kind were as follow.

No.		C. Q. lb.		
1.	The Red or Sheep Turnep	16	2	0
2.	The White Tankard	16	3	24
3.	The Yellow Turnep	6	1	14
4.	The White Norfolk Turnep	16	3	14
5.	The Green Turnep	6	0	0

Thus we have before us, the Produce of a Ridge of each Kind. As I did last Year, I shall compare the acreable Produce, by first examining our Quantity of Ground in each Ridge, in order to ascertain how many Ridges will be required to make an Acre.

The

The Ridges were 24 Perches in Length, which being multiplied by 21, * shews, that our Ridges were 504 Feet long; and being 5 Feet wide, we are to multiply the Length by the Breadth, and our Answer will be 2520. Thus we have the Number of Feet of Ground in each Ridge. This Number then, is to be the Divisor of 70560, which are the Number of Feet in a Plantation Acre; and our Answer will be 28 exactly, without any Remainder. Thus we find, that 28 of our Ridges make a Plantation Acre. From these Materials, we shall easily ascertain our acreable Produce.

No. 1. The Quantity obtained from a Ridge of the Red Turneps, we have seen, was 16 Hundred, 2 Quarters, which being multiplied by 28, (our Number of Ridges, to the Acre) amounts to 23 Tons, 2 Hundred for the Acre.

No. 2. A Ridge of the White Tankard Turnep, we have seen afforded 16 Hundred, 3 Quarters, and 24 Pounds, which being multiplied by 28, amounts to 23 Tons, 15 Hundred for the Acre.

No. 3. A Ridge of Yellow Turneps we have seen, afforded 6 Hundred, 1 Quarter, and 14 Pounds, which being multiplied by 28, amounts to 8 Tons, 18 Hundred, 2 Quarters for the Acre.

No. 4. A Ridge of the White Norfolk Turnep, we have seen afforded 16 Hundred, 3 Quarters, and 14 Pounds, which being multiplied by 28, amounts to 23 Tons, 12 Hundred, and 2 Quarters for the Acre.

No. 5. A Ridge of the Green Turnep, we have seen, afforded only 6 Hundred, which being multiplied by 28, amounts to 8 Tons, 8 Hundred.

I shall now lay before the Reader a Table of the acreable Produce of these five Kinds of Turneps at one View

* For the Information of my Readers in England, it may not be improper to observe, that 21 Feet is the Perch in *Ireland*.

View, as I did for the Year 1768, with the like comparative Experiment; and therein I shall introduce the Produce of that Year, in order to shew upon Sight, the Difference in Point of Produce in the two Years, which appears indeed to be great; of which, I shall have Occasion to say a little presently

Reca-

Recapitulation, of the acreable Produce of five Kinds of Turneps, for two Years sown in the same Manner in Drills, shewing the Exceedings of one Year, in Point of Produce, over the other.

N ^o .		Year	T.	C.	Q.	lb.	Year	T.	C.	Q.	lb.	Difference.
1.	The Red Turnep in	1768—	39	12	1	7	1769—	23	2	00	0	16 10 1 7
2.	The White Tankard	1768—	44	5	3	27	1769—	23	15	00	0	20 10 3 27
3.	The Yellow	1768—	31	18	1	00	1769—	8	18	2	0	22 19 3 00
4.	The White Norfolk	1768—	40	17	2	10	1769—	23	12	2	0	17 5 0 10
5.	The Green	1768—	24	11	1	26½	1769—	8	8	00	0	15 13 1 26½

Here we see, at one View, a very material Difference between the Produce of the two Years; those of the Year 1769, being much short, in every Kind of those of the Year 1768; and therefore seems worthy of some Consideration; but I shall first offer some Reasons, which as I conceive, contributed much to make this very interesting Difference.

Every one may easily remember, how very wet and cold all last Summer was, and although a wet Season contributes wonderfully to the Growth of Turneps, yet, Warmth is as necessary, otherwise they cannot be large: To the want of that necessary Warmth last Summer, I attribute in Part, the Difference which we have seen in the Produce. There is yet another Cause. There was a Difference in

the Ground ; for although the Turneps of 1769, were sown upon Land which had produced Potatoes in the Year before, as well as that under Turneps in 1768, had in 1767, yet the Ground in itself was not so good, as the former ; and indeed, I had better Turneps this Year upon an Acre of the same Ground which bore Turneps in 1768, than any of those upon the other Ground, of which I have been giving the Account ; however that was the Part more immediately intended for Experiment, and although the Crops were abundantly deficient of what I have had in other Years, yet they were so far from being contemptible, that I wish every Farmer in Ireland, would have three Acres every Year as good.

The Difference which we have seen in the Produce of the two Years, affords the strongest Testimony of the Importance there is, in either choosing good Ground, or preparing that which is bad, very highly, for the Reception of Turneps. We see also, that in Ground indifferent in itself, there is not so great a Difference between No. 1. No. 2. and No. 4, as when the Land is better, as to No. 3. and No. 5. we see they are but very indifferent on ordinary Ground.

I presume, if we had never had a greater Produce of Drilled-turneps, than the past Year, it would have been productive of an Objection to the Drilling of them. However, I find *that* the best Method for this Plant, and I dare say, few better Crops are produced in Ireland than the last, in the common Husbandry ; but let us see what the drilled has produced with me in three different Years.

In the Year 1764, my drilled afforded 47 Tons, 2 Hundred, 3 Quarters and 2 Pounds ; in 1768, the best, 44 Tons, 5 Hundred, 3 Quarters, and 27 Pounds ; in 1769, those which I weighed, though not the best I had, afforded 23 Tons, 15 Hundred.

But now for the Land, upon which the Turneps grew this Year. It is a stiff, hungry, unkind, shallow Soil,

Soil, upon a Kind of rotten, flaty, Lime-stone, over a massy Lime-stone Quarry, ever under the Plough, and I suppose in five hundred Years has never had any Manure, until I dressed it.

I think this second Set of Experiments, when compared with the first, are sufficiently conclusive, to reject the Yellow, and the Green Turneps, as to the Purposes of the Farmer, and therefore I think it will be unnecessary to experiment any further upon them.

The Difference between the other three Kinds for the Year 1769, appears not to be so great, as in the Year 1768, and therefore there is no determining with any Certainty, which of these are to be preferred.

Says the Author of the Husbandman's Kalender,* "Horses will feed fresh upon the Yellow Turnep, and thrive upon it." This was the Consideration which induced me to continue the Yellow Turnep another Year; but like some other Things in that Work,† and many others compiled by Men who *farm in their Studies only*; I find this Food for Horses would be very troublesome. The Turnips require to be washed as carefully as if they were for the Table, their smallness immerses them in Dirt, and they are a precarious Crop, and insufficient in Quantity. Besides, they must all be sliced

* This, I apprehend is a Work, not in the Hands of many, although a Part of the Compleat Body of Husbandry, but was published long after, by Way of Continuation to the same Work, from which the Compiler I presume, framed his Kalender, and annexed it to the Continuation of the whole Work. Fol. p. 79.

† I beg I may not be misunderstood as to this Work, I think it a very able one, and is the Production of much Labour and Application, though only a Booksellers Book; but the Work abounds with Mistakes, Misinformation, and Error, at the same Time is fit for the Inspection of a Man of Experience, though dangerous in some Points, in the Hands of the Unexperienced.—When I commenced Farmer about sixteen Years ago, this Book led me astray in many Instances;—and yet in Abundance it affords great Information.

sliced very nicely for Horses, and at best they are too cold and watery for that Animal.—Under these Circumstances, I think the Farmer may safely strike this Turnep out of *his* List of Plants.

I shall now, in the following Table, take the Aggregate of each Kind, of the Turneps, which have engaged my Attention for two Years past, in order to ascertain the Medium Produce that may be reasonably expected one year with another (when for this Purpose I take a good and a bad Year) and perhaps thereby may determine a *temporary* Choice to the Cultivator, until repeated Experiments shall afford positive Information, which Kind are at all Times to be chosen; though it may not be improper for me to premise, that were I to cultivate Turneps in Bogs, Moors, stiff Clays, or any wet ground, without Attention to Experiment, I should not hesitate to prefer the Tankard, or Long Turnep, for Reasons mentioned in my Report for the Year 1768, p. 55.

*The Produce by the Plantation Acre, of five different
Kinds of Turneps, for the Year 1768 and 1769.*

	T. C. Q. lb.				
No. 1. The Red, in 1768,	39	12	1	7	
in 1769,	23	2	0	0	Medium.
	<hr/>				T. C. Q. lb.
The Aggregate for 2 Years,	62	14	1	7	31 7 0 17½

	T. C. Q. lb.				
No. 2. The White Tankard	}				
in 1768,		44	5	3	27
in 1769,		23	15	0	0 Medium.
		<hr/>			
The Aggregate for 2 Years,		68	0	3	27--34 0 1 27½

	T. C. Q. lb.				
No. 3. The Yellow, in 1768,	31	10	1	0	
1769,	8	18	2	0	Medium.
	<hr/>				T. C. Q. lb.
The Aggregate for 2 Years,	40	8	3	0--20	4 1 14

	T. C. Q. lb.				
No. 4. The white Norfolk	}				
in 1768,		40	17	2	10
in 1769,		23	12	2	0 Medium.
		<hr/>			
The Aggregate for 2 Years		64	10	0 10--32	5 0 5

	T. C. Q. lb.				
No. 5. The Green, in 1768,	24	11	1	26½	
in 1769,	8	8	0	0	Medium.
	<hr/>				T. C. Q. lb.
The Aggregate for 2 Years,	32	19	1	26½-16	9 2 27½

Recapitulation of the medium Produce for two Years.

		T. C. Q. lb.
N ^o . 1.	The Red. Medium of	31 7 0 17½
— 2.	The white Tankard. Medium of	34 0 1 27½
— 3.	The Yellow. Medium of	20 4 1 14
— 4.	The white Norfolk. Medium of	32 5 0 5
— 5.	The Green. Medium of	16 9 2 27½

Thus we have the medium Produce, which may be reasonably expected from these different Kinds of Turneps, upon a Plantation Acre of Land in the Drill Way.—But as I am upon this Subject, I cannot allow myself to omit mentioning a Turnep of extraordinary Size, which I saw last Autumn. Colonel *Marley*, a Neighbour of mine, cultivates his Turneps chiefly in the Drill Way, as I do, and in general his Turneps are larger than mine; his Soil being of a better Kind, has not been harrassed by Tillage as mine has been, it never having been in the Occupation of a Common Farmer; at least I suppose for some Centuries past. The Turnep I mean, was taken up by the Colonel out of his drilled Crop, and weighed twenty-one Pounds. I never had any that exceeded fifteen Pounds: A Difference of six Pounds in a single Turnep, is a prodigious Thing, when compared with one of fifteen. But when we come to consider the Difference between such Turneps as his and mine, and those cultivated by the generality of Persons who grow them (for it can hardly be called Cultivation) in the common Way without Hoeing, the Difference becomes immense, and proves beyond all possibility of Doubt, the great Superiority of the Drill Culture for this Plant.

But this extraordinary Turnep of Colonel *Marley's* deserves further Consideration; it is an Example worthy of a Gentleman, and with an Hope of animating Mankind a little, to the proper and careful Culture of Turneps; and to shew, that although I have had, as I imagined, very great Crops, even above forty-seven Tuns an Acre, yet, when we calculate upon Turneps of the

* See my Report of 1764, p. 38.

Size produced by Colonel *Marley*, my Produce, which I considered very extraordinary, dwindle upon the Comparison, into Diminutiveness.

Not to take up too much Time of the Reader, I shall in brief state a little Table calculating upon a Crop of Turneps, from ten Pounds a Piece one with another, to twenty-one Pounds a Piece, one with another.

In my former Reports I have informed the Publick, that I leave my Turneps one Foot asunder in the Rows, and that I make my Ridges five Feet broad, consequently the Rows are five Feet asunder, and therefore, each Turnep occupying a Foot in each Row, in fact, occupies five Feet of Ground. Upon this State, I shall frame my Table; though I am persuaded, the common Turnep Cultivator would laugh at this Allowance, but I only pray his Patience.

A Plantation Acre contains 70560 Feet. Each Turnep occupying 5 Feet, that is to be the Divisor of our Number of Feet in an Acre.—Our Answer will be 14112, which are the Number of Turneps that will stand upon an Acre, allowing each Turnep five Feet of Ground.

This Number then, of 14112, is to be multiplied by the Weight we suppose the Turneps to be, as already mentioned, one with another.—The following Table will shew the Answer to each Size, from ten to twenty-one Pounds a Piece, one with another.

A Table

A Table, shewing at one View, the acreable Produce of Turneps in Drills, the Turneps being from ten to twenty one Pounds a Piece.

				T. C. Q. lb.			
14	11	2	Turneps, at 10 Pounds each, amount to	63	0	0	0
14	11	2	ditto—11 ditto	69	6	0	0
14	11	2	ditto—12 ditto	75	12	0	0
14	11	2	ditto—13 ditto	81	18	0	0
14	11	2	ditto—14 ditto	88	4	0	0
14	11	2	ditto—15 ditto	94	10	0	0
14	11	2	ditto—16 ditto	100	16	0	0
14	11	2	ditto—17 ditto	107	2	0	0
14	11	2	ditto—18 ditto	113	8	0	0
14	11	2	ditto—19 ditto	119	14	0	0
14	11	2	ditto—20 ditto	126	0	0	0
14	11	2	ditto—21 ditto	132	6	0	0

Here we have the Table, shewing the Produce upon the different Sizes, and the Amount to me is amazing, and yet, any one who shall take the Trouble to examine the Calculations, will find them, I hope, to be correct.—When we should see twelve Turneps, each weighing from ten to twenty-one Pounds, we should say very coolly, “they are fine Turneps.” I shall beg Leave to lay in an Exception for myself, and some few others, Admirers of such Productions, who would be as much delighted therewith, as others are at the Sight of a fine Horse; two Productions of Nature, in my Mind, in which there is no Comparison in Point of intrinsic Value; not but I think the Horse a very valuable Creature, so far as his Use is considered; throwing that out of the Question, he is as much, nay, more a Nuisance to Society than a Wolf, or any other pestiferous Animal.—But to return, I say, we should think *such*, fine

* I have just received a Letter from a celebrated and justly admired Writer in England, in which he tells me of a noble Lord, who this Year had fifty-two Tons per English Acre drilled, and forty eight broad-cast: To the Plantation Acre, that is, in the Proportion of 83 Tons, 4 Ct. drilled.—76 Tons 16 Ct. broad-cast.

† I wish in these Kingdoms, we were more of a Mind with the Chinese. “The Chinese wish rather to maintain *Men* than *Horses*.”

Turneps; but would any Man imagine before Calculation, that supposing the whole Produce to be ten Pounds a Piece, the Production of an Acre would amount to sixty-three Tons;—How much less would he imagine, that at twenty-one Pounds a Piece, it would amount to above one hundred and thirty-two Tons?—May we not then strike a Medium, and suppose them at sixteen Pounds a Piece, in that Case, the Produce would be above an hundred Tons.—Surely then, such Expectations, where People have good Land, and Plenty of Manure, are enough to animate extraordinary Application, with a reasonable Hope of obtaining from sixty to an Hundred Tons of Turneps an Acre.

For the Quantity of Turneps which horned Cattle will eat, I refer the Reader to my former Reports.

Variety of Experiments, and Considerations upon the Cabbage Husbandry.

I come now to the Cabbage Husbandry; my Experiments upon which, I flatter myself will furnish some Information to the Publick; a Consideration which affords me the more Happiness, from its being a Subject of real Importance to Mankind, not only in its immediate, but consequential Use.

For the clearer Treatment, and Explanation of my Experiments, I shall divide them into two Sets, the clearer to distinguish what I call the Winter Plants, from those which I call the Spring Plants*; the first Set of Experiments will therefore be upon the Winter Plants.

First

* The Plants which are produced from the Seed sown in August, are those which I call the *Winter* Plants. And those produced from the Seed sown in March are those which I call the *Spring*, or Summer Plants.

First Set of Experiments on Cabbages of different Kinds, being Winter Plants.

The several Kinds were as follow:

- Nº. 1 The Green Boorcole.
- 2 The Long-sided Cabbage.
- 3 The Flat Dutch Cabbage.
- 4 The Great Scotch Cabbage.
- 5 The Anjou Colewort.
- 6 The Battersea Cabbage.
- 7 The York Cabbage.
- 8 The Sugar-loaf Cabbage.
- 9 The Green Savoy Cabbage.

Of these Kinds, I sowed in the Month of *August* 1768, two Ounces of the Seed of most of them, of some I sowed four Ounces, in Expectation, that I should have more Plants than would plant two Acres of Ground for me; but my Number of Plants proved insufficient, as will appear presently.

On the 6th of *March* following, I put out the Plants of these several Kinds, at once out of the Seed Bed, upon a Trifle more than one Acre of the Ground which had produced the Turneps mentioned in my Report for the Year 1768, and in the Year 1767 Potatoes, as mentioned in that Report. For the Reception of these Plants, the Land got no other Preparation, than that of being twice ploughed after the Turneps were taken off; for let it be remembered, that I always carry my Turneps off. My Number of Plants proving insufficient for the whole Ground, as already hinted, I was obliged to sow Turneps in the Remainder of it, hath been already mentioned, when I was upon the Subject of Turneps.

In this State the Plants remained until they were Horse-hoed, which was performed on the 25th and 26th of May for the first Time, again in June, and the last Time in *August*,

Let me describe the Manner. Every one who has read my Reports know, that the Hoeing is performed with a small Plough, drawn by a Pair of Horses one before the other.—When the Cabbages were Horse-hoed, the Ploughman enters his Plough, and throws into the Furrow one Side of the Ridge, and then does the same with the Side of the next Ridge; by this Means a small Ridge now stands in the Middle of the Furrow: thus he goes through the whole Plantation, leaving, *observe*, one Side of every Ridge untouched; for were he to take off both Sides in this Work, he would throw down the Plants. He then returns to where he began, and proceeds in the same Furrow, and goes as close to the Plants and as deep as he can, for he seldom can go nigh enough to the Plants at the first Hoeing, and therefore, this second Operation will be necessary where the Rows are five Feet asunder. He then comes to where he began, and returns one bold Sod of the Plough to the Plants.—Then he proceeds to take off the other Side of each Ridge as before-mentioned, and returns that in like Manner.—Here we stop for a fortnight, three Weeks or a Month. But observe there will be a Ridge of Earth still left in the Furrow, which the Farmer calls the Hunting. This *Hunting* then, is to be completely raised up to the Ridges by two Sods, in the next Operation.—Your Plants will now be spread a good Deal, and will continue to do so.—In *July* or *August* approach them as before, taking the Earth from them; but *one* Sod will be sufficient, as you cannot now approach them so close as before, neither should you. Some few Leaves will be broken off by this Work, but in no Proportion so many as would be imagined.—You are now to return the Earth to the Plants, and the Business is over for the Season.—The Roots will immediately proceed to penetrate this last reduced Mold, and pass away to the Furrows, which gives

gives new Vigour to your Plants. The Expence of these *several* Operations depend upon the Nature and Condition of the Land, from three to six Shillings an Acre. The doing this Acre stood me in five Shillings and six Pence.—Having premised this much in Relation to the Culture, I shall now proceed to the Produce.

Nº. 1. The Green Boorcole.—This Plant made no Figure at all, but early in May, run, and was not worth any Thing, it consisting only of one small Stem, about a Foot high, with scarce any Leaves; and I am sure there was not a single Plant of the whole, that weighed half a Pound. Here, we have at once a conclusive Information, that this Species of the Cabbage Tribe, although so truly valuable as a Summer Plant, as will appear hereafter, will not answer any Sort of good Purpose, as a Winter Plant.—The Failure of this Boorcole made so shameful a Figure in the Field amongst the other Kinds; that I ploughed it up, and supplied the Place with Summer Plants of other Kinds.

Nº. 2. The Long-sided Cabbage.—This Plant throve extremely well, became very large, and many of them weighed sixteen Pounds.—But although it has the Appearance of an hard Cabbage, yet in reality, it is not so, but internally, is loose and fuzzy; very susceptible of receiving Injury by Rain and Frost, when arrived to Maturity: burst in *October* and *November*, and proceed to Putrefaction very shortly afterwards.—Nevertheless, this Cabbage is, from its great Size and speedy Growth, of excellent Use for early Feeding, either horned Cattle, or Sheep; but as Grass is pretty plenty at that Time, this Plant will answer to great Advantage to maintain a large Stock of *Store Swine*, for they thrive and grow upon it, and indeed upon all the Cabbage Tribe, exceedingly well, of which I shall have Occasion to say something more hereafter.

Each Row of these Cabbages were thirty Perches long, or six hundred and thirty Feet. Each of our
Plants

Plants occupying* two Feet, our Number consequently in each Row were 315 Cabbages.—One Row weighed 33 C. 3 qrs. 27 lb. which is in the Proportion of twelve Pounds one Ounce and about a Quarter to a Plant, one with another; though some of them weighed sixteen Pounds.

N^o. 3. The Flat Dutch Cabbage. This Plant thrrove extremely well, but did not *close* so soon as N^o. 2. It is excellent for the Purposes of fattening horned Cattle and Sheep, and maintaining Store Swine.—This Cabbage becomes wonderfully hard, and is an excellent Sort for the Purposes of the Farmer and Grazier; it stands firm and sound until after Christmas, except, that the outside Leaves drop off, which should therefore be pulled, and made use of before they decay, for they afford Abundance of Food.—One Row of these Plants weighed 34 C. 1qr. 22lb. The Number in the Row being three hundred and fifteen, the Produce in Weight is in the Proportion of twelve Pounds and near four Ounces to each Plant, one with another, though I had some that weighed above twenty Pounds.

N^o. 4. The Great Scotch Cabbage. This Plant thrrove extremely well, closed much in the same Manner as N^o. 3, and is also very hard and close; and in every Respect has so much the Appearance of N^o. 3, that I am very inclinable to believe, I am either deceived in the Seed, or that it is no other than the Flat Dutch, Cabbage N^o. 3.—It has all the Excellencies of the former, and stood with me until after Christmas, before it began to decay; except that the outside Leaves came off in the same Manner as those of N^o. 3.

One

* Occupying I say two Feet.—Whereas if you order the Men to put them down two Feet asunder, they will put them two Feet four Inches, and sometimes more, for this Reason, give them a Measure only twenty Inches long, when you would have the Plants two Feet asunder, otherwise they will mightily over-run the Measure in the Course of an Acre.

One Row of this Plant weighed 34 C. 0 qrs. 11 lb. 6 oz. The Number in the Row being 315, this Weight is in the Proportion of twelve Pounds and two Ounces to a Plant, though some of them weighed nineteen Pounds and a Half.

N^o. 5. The Anjou Colewort. This was my first Essay upon this Plant, except about half a Dozen, which I had once before in my Garden. The Appearance of that half Dozen, induced me to plant them out in the Rows at three and four Feet from each other. They throve extremely well. They grew from five to eight Feet high, and I think without much Improprity, might be called the Cabbage Tree. They produce an Immenstity of Leaves, which are of excellent Use for foddering Cattle. I cut some of them which weighed twenty-four Pounds a Piece in *October*; but they were not all of that Size; though I have but little Doubt, where good Ground in Nature shall be highly prepared for them, but they may be brought to forty and fifty Pounds a Plant.

The Leaves begin to fall off in *November*, which indicates that they should be stripped for Use by that Time, and the Stalks left standing.—As the Leaves drop off, they throw out fresh Shoots, and continue to do so all the Winter, so that in the Spring, the Stalks are again well furnished with Leaves; and as some Testimony thereof, on the 19th of *April*, I sent a Plant to the DUBLIN SOCIETY, which had stood the Winter, that weighed twenty-one Pounds, including the Root and Stalk, for which I allow three Pounds; in that Case, the Food will be eighteen Pounds, a prodigious Production on the 19th of *April*!

The Plants only three Feet asunder in the Rows, were near as large and luxuriant as those at four Feet, and consequently produced much more Food, for I cut half a Row of each in *October*. Those at four Feet Distance affording seventy-eight Plants, which weighed 11 C. 3 qrs. 10 lb. which is in the Proportion of seventeen Pounds to a Plant. The Ridge we may therefore say, produced

produced 23 C. 2 qrs. 20 lb.—Half a Row of those at five Feet Distance, afforded 105, which weighed 15 C. 1 qr. 24½ which is in the Proportion of 16½ Pounds to a Plant. The Ridge we may therefore say, produced 30 C. 3 qrs. 21 lb.—This will make a vast Difference between the three and four Feet Distance, when we come presently to compare the acreable Produce.

Nº. 6. The Battersea Cabbage. This Plant throve expeditiously, it being a small Kind; I put the Plants down only eighteen Inches asunder in the Rows; our Number consequently were 420 upon a Ridge, though they over-run, I think, three or four.—This Species of Cabbage closed early, and threatens Decay sooner than either Nº 3 or 4, and therefore only answers for early Autumn Use, for the same Purposes as those already mentioned.—One Ridge of this Sort produced at Michaelmas 13 Ct. 14 lb. which is in the Proportion of 3½ Pounds to a Plant, one with another, though some of them weighed upwards of five Pounds, and some others but two.

Nº. 7. The York Cabbage. This Kind thrives still more expeditiously than Nº. 6, and still sooner threatens Decay. For the same Reason as Nº. 6, I also put the Plants of this Kind only eighteen Inches asunder in the Rows.—Our Number was 421 upon each Ridge. One Ridge produced at Michaelmas, 11 C. 2 qr. 27 lb. 10 oz. which upon an Average is three Pounds and two Ounces to a Plant. Some weighed five Pounds, and some only a Pound and an Half.

Nº. 8. The Sugar-loaf Cabbage. This Kind is also expeditious in its Growth, but like the long-sided Nº. 2, is a loose, fuzzy Cabbage, which perishes early.—Being also but a small Kind, I planted them in the Rows only eighteen Inches asunder, as the two former Kinds. Our Number upon a Ridge were 420. One Ridge produced 11 Ct. 1 qr. which, upon an Average, is three Pounds to each Plant; but few of them exceeded four Pounds. They answer all the Purposes of the former Kinds for early Use.

Nº. 9.

N^o. 9. The Green Savoy Cabbage. This is an excellent Plant, and were it a large Kind, would, from its excellent Quality of standing the Winter, beat all the preceding Kinds for our Purpose of feeding horned Cattle and Sheep, and of maintaining Swine. But it takes its Place among the Class of small Cabbages, though it is larger than most of them. The Green Savoy is some Time before it closes to form the Cabbage, and when formed, bears Wet and Frost, a long Time, without bursting, or being tainted by Putrefaction. These Plants were put down eighteen Inches asunder also, and our Number upon a Ridge were 420.—One Ridge produced the latter End of *October*, 16 C. 3 qrs. 14lb. which upon an Average, amounts to $4\frac{1}{2}$ Pounds to a Plant.—Some of them weighed Six Pounds. They are excellent for all the Purposes of the former Kinds.

I shall now recapitulate the several Productions before I proceed to ascertain the acreable Produce, in Order to shew at one View, the Produce of each Kind, upon a Ridge of thirty Perches long, their *average* Weight, and their *extraordinary* Weight.

Recapitulation

Recapitulation of the Produce of the nine Kinds of Cabbages from each Ridge, 630 Feet long, and 5 Feet wide, with their Average and extraordinary Weight; all being Winter Plants.

	<i>Distance.</i>	<i>Ct. qr. lb. oz.</i>	<i>Aver.</i>	<i>Ext.</i>
N ^o . 1. Green Boorcole	18 In. by 5 f.	0 0 0 0	0	0
2. The Long-sided,	2 f. by 5.	33 3 27	12 1 $\frac{1}{4}$	16
3. The Flat Dutch,	2 f. by 5.	34 1 22	12 4	20
4. The Scotch,	2 f. by 5.	34 0 11 6	12 2	19 $\frac{1}{2}$
5. The Anjou Colwort	4 f. by 5.	23 2 20	17	24
Ditto,	3 f. by 5.	30 3 21	16 $\frac{1}{2}$	
6. The Battersea,	18 In. by 5 f.	13 0 14	3 $\frac{1}{2}$	5
7. The York,	18 In. by 5 f.	11 2 27	3 2	4
8. The Sugar-loaf,	18 In. by 5 f.	11 1 0	3	4
9. The Green Savoy,	18 In. by 5 f.	16 3 14	4 $\frac{1}{2}$	6

I shall now compare the acreable Produce of these nine Kinds of Winter Plants, by first examining our Quantity of Ground in each Ridge, in order to ascertain how many of them will be required to make a Plantation Acre.

I have already said our Ridges were thirty Perches in Length, which being multiplied by twenty-one, shews they were 630 Feet long, and being five Feet wide, we are to multiply the Length by the Breadth, and our Answer will be 3150, which are the Number of Feet of Ground in each of our Ridges. This is to be the Divisor of 70560, which are the Number of Feet in a Plantation Acre, and our Answer will be 22, and a Fraction of 1260 Feet, or $\frac{1}{8}$ of an Acre.

Thus we find, that 22 of our Ridges make a Plantation Acre, wanting 1260 Feet. Upon this Ground we are to frame our Calculations of the acreable Produce, of the nine Kinds of Cabbages already mentioned.

N^o. 1. The Green Boorcole. In the preceding Recapitulation, and from what was before said, it may be observed that this Plant did not produce any Thing. Let us not, therefore, pronounce hastily against it, for it will presently be found of most excellent Use. But we are by this Experiment, fully informed, that it will not answer any Purpose at all, to sow the Seed in *August*, and to put the Plants out in the Spring, and therefore it is in vain to attempt it. And yet from the Cabbage, Culture having made some Progress since my Report for the Year 1764, some Gentlemen have informed me, that they have been wonderfully successful in *this* Culture of Boorcole. But theirs, (or perhaps mine) cannot be Boorcole. It must be some other Plant which does not close or cabbage, of which I can readily believe there are an infinite Number, arising from the Carelessness practised in growing the Seeds of this whole Tribe; the farina of which will ingender, and produce a distinct Species, when different Kinds are within a moderate Distance of each other, at the Time they make their Effort to generate their Seed: And indeed, this Effect is so powerful, that it is not clear to me, but thirty or forty Perches are too nigh for distinct Kinds to form their Seed without Corruption.—However, the Boorcole, (at least that which I have for it) in this Set of Experiments must be left totally out of the Question, because it affords no Subject for Calculation; I shall therefore proceed with the other Kinds.

N^o. 2. The Long-sided Cabbage. A Ridge of this Plant we have seen, afforded 33 C. 3 qr. 27 lb. which being multiplied by 22, amounts to 37 Tons, 7 Ct. 3 qr. 6 lb. To this we are to add the Fraction of 1260 Feet, in order to make up the Acre. The Produce of this Plant, amounts to something more than 19 Ounces to a Foot of Ground, 19 then is to be our Multiplier of 1260, which amounts to 13 Ct. 1 qr. 12 lb. 4 oz. which being added to the Produce of 22 Ridges, make our acreable Produce of the Long-sided Cabbage 38 Tons, 1 Ct. 18 lb. 4 oz.

N^o. 3. The Flat Dutch Cabbage. A Ridge of this Plant we have seen afforded 34 Ct. 1 qr. 22 lb. which being multiplied

multiplied by 22, amounts to 37 Tons 17 Ct. 3 qr. 8 lb. To this we are to add the Fraction of 1260 Feet, in order to make up the Acre. The Produce of this Plant amounts to something more than $19\frac{3}{4}$ Ounces to a Foot of Ground. $19\frac{3}{4}$ then, is to be our Multiplier of 1260, which amounts to 13 Ct. 2 qr. 23 lb. 10 oz. which being added to the Produce of 22 Ridges, make the acreable Produce of the Flat Dutch Cabbage 38 Tons 11 Ct. 2 qr. 3 lb. 10 oz.

Nº. 4. The Great Scotch Cabbage. A Ridge of this Plant we have seen afforded 34 Ct. 0 qr. 11 lb. 6 oz. which being multiplied by 22, amounts to 37 Tons, 10 Ct. 26 lb. 4 oz. To this we are to add the Fraction of 1260 Feet, in order to make up the Acre. The Produce of this Plant is in the Proportion of upwards $19\frac{3}{4}$ Ounces to a Foot of Ground.— $19\frac{3}{4}$ then is to be our Multiplier of 1260, which amounts to 13 Ct. 3 qrs. 15 lb. 5 oz. which being added to the Produce of 22 Ridges, make our acreable Produce of the Great Scotch Cabbage 38 Tons, 4 Ct. 13 lb. 9 oz.

Nº. 5. The Anjou Colwort. We must bring this Plant under two Calculations, on Account of the different Distances of planting them out. I shall begin with those of four Feet Distance.

We have seen that a Ridge of this Plant, at four Feet Distance in the Rows, afforded 23 Ct. 2 qr. 20 lb. which being multiplied by 22, amounts to 26 Tons, 3 qr. 20 lb. To this we are to add, the Fraction of 1260 Feet, in order to make up the Acre. The Produce of this Plant at four Feet Distance, amounts to near $13\frac{1}{2}$ Ounces to a Foot of Ground.— $13\frac{1}{2}$ then is to be our Multiplier of 1260 Feet, which amounts to 9 Ct. 1 qr. 27 lb. 2 oz. which being added to the Produce of 22 Ridges, makes our acreable Produce of the Anjou Colewort at four Feet asunder in the Rows 26 Tons, 10 Ct. 1 qr. 19 lb. 2 oz.

Anjou Colewort, the Plants three Feet asunder in the Rows, we have seen, afforded 30 Ct. 3 qr. 21 lb. which

which being multiplied by 22, amounts to 34 Tons, 2qr. 14 lb. To this we are to add, the Fraction of 1260 Feet, in order to make up the Acre. The Produce of this Plant at three Feet Distance, amounts to near $17\frac{3}{4}$ Ounces.— $17\frac{3}{4}$ then, is to be our Multiplier of 1260 Feet, which amounts to 12 Ct. 1qr. 25lb. 13 oz. which being added to the Produce of 22 Ridges, make our acreable Produce of the Anjou Colewort, at three Feet asunder in the Rows 34 Tons 13 Ct. 11 lb. 13 oz.

It is not unworthy of Observation, that by this comparative Experiment, here is a Difference in Produce upon one Acre of the same Plant, upon the same Ground, planted on the same Day, of no less than above eight Tons. Nothing surely, can manifest more truly, the Importance of making Experiments of this Kind; and convinces me, that although I have gone pretty far in the Culture of Cabbages, and several other Plants, that much more is yet to be done, to ascertain by Experiment, what are the *Distances* and *Culture*, which will afford the greatest Crops of such Plants as are, and should be within the Farmers Department.

Nº. 6. The Battersea Cabbage. A Ridge of this Plant we have seen afforded 13 Ct. 14 lb. which being multiplied by 22, amounts to 14 Tons, 8 Ct. 3qr. To this we are to add the Fraction of 1260 Feet, in order to make up the Acre. The Produce of this Plant is in the Proportion of something less than $7\frac{1}{2}$ Ounces to a Foot. $7\frac{1}{2}$ then is to be our Multiplier of 1260, which amounts to 5 Ct. 1 qr. 2 lb. 10 oz. which being added to the Produce of 22 Ridges, makes our acreable Produce of the Battersea Cabbage 14 Tons, 14 Ct. 2lb. 10 oz

Nº. 7. The York Cabbage. A Ridge of this Plant, we have seen afforded 11 Ct. 2qr. 27 lb. which being multiplied by 22 amounts to 12 Tons, 18 Ct. 1 qr. 6 lb. To this we are to add the Fraction of 1260 Feet, in order to make up the Acre. The Produce of this Plant, is in the Proportion of something more than $6\frac{1}{2}$ Ounces to a Foot. $6\frac{1}{2}$ then is to be our Multiplier of 1260, which amounts to 4 Ct. 2 qr. 8 lb. 14 Ounces. which being

being added to the Produce of 22 Ridges, makes our acreable Produce of the York Cabbage 13 Tons, 2 Ct. 3 qr. 14 lb. 14 oz.

Nº. 8. The Sugar-loaf Cabbage. A Ridge of this Plant we have seen afforded 11 Ct. 1qr. which being multiplied by 22, amounts to 12 Tons, 7 Ct. 2 qr. To this we are to add the Fraction of 1260 Feet, in order to make up the Acre. The Produce of this Plant is in the Proportion of above $6\frac{1}{4}$ Ounces to a Foot of Ground. $6\frac{1}{4}$ then, is to be our Multiplier of 1260, which amounts to 4 Ct. 1qr. 20 lb. 3 oz. which being added to the Produce of 22 Ridges, make our acreable Produce of the Sugar-loaf Cabbage 12 Tons, 11 Ct. 3qr. 20lb. 3 oz.

Nº. 9. The Green Savoy Cabbage. A Ridge of this Plant we have seen afforded 16 Ct. 3qr. 14 lb. which being multiplied by 22, amounts to 18 Tons, 11 Ct. 1qr. To this we are to add our Fraction of 1260 Feet, in order to make up the Acre.—The Produce of this Plant is in the Proportion of something more than $9\frac{1}{2}$ Ounces to a Foot. $9\frac{1}{2}$ then, is to be our Multiplier of 1260, which amounts to 6 Ct. 2qr. 18 lb. 14 oz. which being added to the Produce of 22 Ridges, makes our acreable Produce of the Green Savoy Cabbage, 18 Tons, 17 Ct. 3 qr. 18 lb. 14 oz.

Recapitulation

Recapitulation, of the acreable Produce of nine Kinds of Cabbages, the Seeds thereof being sown in the Month of August, and the Plants put out in the Spring.

<i>The Table of acreable Produce</i>	<i>Distance.</i>	<i>Produce per Acre.</i>				
		<i>T.</i>	<i>C.</i>	<i>qr.</i>	<i>lb.</i>	<i>oz.</i>
N ^o . 1. The Green Boorcole,		0	0	0	0	0
2. The Long-sided,	2 f. by 5.	38	1	0	18	4
3. The Flat Dutch,	2 f. by 5.	38	11	2	3	10
4. The Scotch,	2 f. by 5.	38	4	0	13	9
5. The Anjou Colewort,	4 f. by 5.	26	10	1	19	2
Ditto,	3 f. by 5.	34	13	0	11	13
6. The Battersea,	18 l. by 5 f.	14	14	0	2	10
7. The York,	18 l. by 5 f.	13	2	3	14	14
8. The Sugar-loaf,	18 l. by 5 f.	12	11	3	20	3
9. The Green Savoy,	18 l. by 5 f.	18	17	3	18	14

Here we have a complete, comparative View of the acreable Produce of eight Kinds of Cabbages, in this first Set of Experiments, from Winter Plants; and a conclusive Information, that the Boorcole will not answer being sown in *August*, and put out in the Spring; and I think, the Farmer may reject N^o. 6, N^o. 7, and N^o. 8, because we see they are far deficient in Point of Produce, when compared with the Kinds preceding; but as to N^o. 9, that has Excellencies, although deficient in Weight, which should not too hastily determine its Expulsion from the Field, until it has at least had some further Trials.

I am now to make some Observations in this Place, upon the Gradations of Time, in which these eight Kinds will stand, and the Uses which I made of them. And to render this first Part of the Enquiry perfectly intelligible and distinct, I shall divide the eight Kinds of Cabbages, of which I have given the Produce, into Classes, in their respective Order of Duration.

E

The

The Class first in Decay.

The Long-sided Cabbage, N^o. 2, the Battersea, N^o. 6, the York N^o. 7, and the Sugar-loaf, N^o. 8, are of the Class which first decay. Whoever shall be induced from these Experiments to go extensively into the Cabbage Culture, and shall be inclined to have different Kinds, in order to have a regular Succession of this Pasture, will observe, that these four Kinds must come first into Use, as they are not capable of standing the Winter in Health, after *October*, or at farthest, *November*; Allowances being made for the Difference of Seasons, which in some Cases may enable them to stand a little longer, and in others, may earlier bring on Putrefaction. But from the insufficient Produce of N^o. 6, 7, and 8, I should recommend for early Use, that N^o. 2 be chosen alone out of this Class.—From the perishable Disposition of this Class, many Persons may be induced to reject these four Kinds, in Preference to some of the others, and perhaps with good Reason; that is not my Case; from the Nature of my Pursuits, I must introduce every Kind of this, and every other Species of Plant, and every Species of Culture, for the Information of the Publick, so long as I continue in the Occupation I am in.

The Class second in Decay.

The Flat Dutch Cabbage, N^o. 3, and the Scots N^o. 4. These are excellent Kinds, such, as I can from Experience recommend, for the Purposes of the Farmer and Grazier; but with me, the external Leaves fall off in *November*, and soon after Christmas the Cabbages or solid Parts begin to decay.

This requires some Observation. In my Introduction to this Report, I have mentioned the great Progress made in England, in the Cabbage Husbandry, for which

Information

Information we are obliged to the arduous Labours of the ingenious Mr. Young. He gives amazing Accounts of its Progress; and it seems to be universally agreed, that the Cabbage answers all the Purposes of maintaining and fattening horned Cattle and Sheep. — The Kind, which seems to be in most general Use, is the Scotch; though the Turnep Cabbage and the Boorcole are not neglected.

It appears, that this Scotch Cabbage, is generally found with them to stand the Winter; some Gentlemen informed Mr. Young that they stand until *April*, and even *May**. This would be to me surprizing, did I not consider two probable Causes of accounting for it.—In *England*, the Frosts begin in *October* and *November*†, whereas in *Ireland*, those Months and *December*, generally afford mild Weather, attended with Rain, and scarce any Frost, until *January*, *February* and *March*, and even then, in general insignificant, when compared with

* For the fuller Information of the Reader, I shall transcribe Mr. Young's Table of Duration. Vol 4. p. 183.

“ Spring Sowing.”

	<i>Duration.</i>
“ Mr. Middlemore, -	April.”
“ Mr. Lyfter, - - -	Christmas.”
“ Mr. Tucker, - -	End of March.”
“ Mr. Ellerker, - -	End of April.”
“ Mr. Smelt, - -	End of March.”
“ Mr. Scroop, - -	Beginning of May.”

“ Summer Sowing.”

“ Mr. Tucker, - -	{ Want cutting before Christmas.”
“ Mr. Crowe. - -	
	May Day.”

† Some twenty Years ago, I have been skating on the Canal in Saint James's, and the serpentine River in Hyde Park, London, early in the Month of November.

with those of *England*, and particularly the northern Parts, where the Cabbage Culture seems to be most adopted:

This Difference of Climate, I think is a probable Cause, why my Cabbages of the *hard* Kind (even the Scotch, if it be the Scots I have) give Way, and threaten Putrefaction so much earlier than they do in *England*, because by the Mildness of this Climate, when compared with that of *England*, I apprehend, Vegetation proceeds, and therefore is premature for our Purpose in this Article;* Whereas, I conceive the early approach of Frost in *England* (particularly to the northern) checks this Effort in the Cabbages to proceed in Vegetation.

However, there is yet another probable Reason why the Cabbage which I have for Scorch, may decay sooner than in *England*: mine, it is very likely, is not the true Kind; and in truth, I have thought them no other than the Flat Dutch, because they appear to be the same: and I am the rather induced to believe this, because I have been so often, so very often deceived by those conscientious Gentlemen, the Seedsmen. However, should I pursue my experimental Enquiries, I hope to be upon a Certainty as to this Species of Cabbage for the Year 1771, as a Gentleman of the Bishoprick of *Durham*, has lately corresponded with me, as to the obtaining some of my Machines; and by his Means I have the Hope of procuring the true Scotch Cabbage, now so much in Esteem in the northern Parts of *England*.

Until that can be done, this Kind must keep its Place, of the second Class in Duration; and if we look at the Table on the other Side, taken from Mr. *Young*, we see
some

* Indeed I observe the like even in the Wheat of Ireland, for in November and December, it looks florid and healthy, even in poor Grounds; but in January, February, even in March, and sometimes in April (as this Year) it falls off wonderfully and looks sickly, except where the Lands are rich and dry.

some of the Gentlemen find theirs to decay as soon as mine*, so that it is mighty likely, these several Gentlemen, have not all the same Species, because, there, the Difference of Climate cannot operate.

The Class third in Duration.

The Anjou Colwort N^o. 5, and the Green Savoy Cabbage N^o. 9, come under this Class.

These two Kinds, although so very different, as that the Anjou, arrives to six and eight Feet high, and to the average Weight of 16 and 17 Pounds, and some extraordinary ones to 24, and the Green Savoy only of small Size, and arrived with me to only four Pounds and an Half upon an Average, and some to six, yet they are of excellent Use, and both came properly under this *third* Class.—Upon these Plants we differ in our Success much more, than the spirited Cultivators in *England* do exceed us in their Advantage of Duration of the Scotch Cabbage.

For says Mr. Young, in his 4th Volume p. 202, “Anjou good for nothing with Mr. Turner, and Mr. Scroop.”
“Savoys

* I have just had the Favour of a Letter from Mr. Young, upon Husbandry Matters, dated the 12th of April, in answer to one I wrote him upon this Subject—And he says,—“As to the Scotch Cabbage, all my Accounts ran, that it lasts quite through April; and I have now Letters by me just received from Mr. Scroope and Mr. Dodsworth, that their present Crop is in fine Order, with but few *black Caps* among them. They are as you observe *hard*, but do not burst until long after their loose Leaves are all dropped off, and their outward Skin turned black.”

These “*black Caps*” I do not like at all, that Complexion I should conceive to be an Indication of Decay; and most certainly is an horrid Sight in a Field, when compared with the beautiful healthy Green, which the Boorcole exhibits all the Winter, until April and May. But certain it is, that Substance is what we want, for that, every Man will give up the pleasing Verdure.

“ Savoy, (I presume the Green Savoy Cabbage) “ This in the same Trial, in Rows four Feet asunder, by one in the Rows, came to five Pounds at an Average, or twenty-four Tons per Acre, which is a considerable Produce. Cattle like them very well, but they would not stand the Winter.”

Here we find the Account which these two Gentlemen gave Mr. *Young* of these Plants, appears to be diametrically opposite to my Success in the Culture of them. With them “ the Anjou good for nothing,” and “ the Savoy would not stand the Winter”. The latter I cannot account for, the former I have I think, fully in my Power, by my Experiments this Year. I can be almost certain, that the Anjou in their Trials, was sown in the Spring, and put out in June, in that Culture I can now inform the Publick, the Anjou are not so luxuriant as I expected they would be, as will appear, when we come presently to our second Set of Experiments, under the Summer Plants; I shall therefore defer saying more on this Head, until we come to some general Observations which will arise upon our several Experiments, tending to the Increase of artificial Pasture.

The Weight of the Anjou has been already stated, its Duration for plentiful Pasture, continues until the Middle of *May*, and the Savoy until *February* is expired.

Thus we have our eight Kinds of Cabbages, brought under three distinct Classes, regulated by their Capability of standing the Winter.—I shall, for the Convenience of the Reader, bring them under Recapitulation, in order to exhibit this Part of the Enquiry at one View, and then I shall proceed to describe the Uses I made of these several Plantations of Cabbages.

Recapitulation

Recapitulation of the different Classes of Cabbages from the Winter Plants, regulated by their Capability of standing the Winter. Or,

The Table of Duration.

The Class *first* in Decay. Duration.

- | | |
|-------------------------------------|-----------------|
| N ^o . 2. The Long-sided. | } Oct. and Nov. |
| 6. The Battersea. | |
| 7. The York. | |
| 8. The Sugar-loaf. | |

The *second* Class.

- | | |
|-------------------------------------|-----------------|
| N ^o . 3. The flat Dutch. | } Dec. and Jan. |
| 4. The Scotch. | |

The *third* Class.

- | | |
|--|--|
| N ^o . 5. The Anjou Colewort. Middle of May. | } Feb. I used all I had by that Time, though I believe they would have stood longer. |
| 9. The Green Savoy. | |

Some Account of the Uses to which I converted these Cabbages.

I have already informed the Reader, that last Summer, I had 83 head of Swine, which I supported from the 24th of May until the 26th of August with mown Clover, when it became too short for mowing.—Under these Circumstances, the Man who had the Care of this Business, came to me, as he had often done before, when he saw the Clover begin to give Way, by his several Months Labour of every-day mowing and carrying off, what he called “unmerciful Quantities”—“Well Sir, what “what will you do now with the Pigs, for the Clover is “just past mowing, and they will all be starved.”

When

When that was really the Case, I desired him to follow me to the Cabbage Field already spoken of, and shewed him which Kind to begin to cut for the Swine, and directed him to give them a Cart-load * every Morning and Evening. The Man was of Opinion the Swine would not eat the Cabbages without being boiled; but he was much mistaken, for they devoured them; and indeed, to see such a Drove of Swine about the Yard, devouring a Load of Cabbage, and the Brittleness and Health of the Plants, added to the Growth, Health and Slickness of the Swine, by only the first Week's feeding, was so much an Entertainment to me, that I have stood for an Hour together, very many Times looking at them with a Pleasure, which can only be conceived by those, who contemplate upon the Satisfaction which will arise, in seeing that honest Industry will produce such Plenty of such good Food, for so voracious, and numerous a Family.—Thus, this Stock was maintained, as long as any of the hard Cabbages remained, except such as was put up to feeding after the Harvest.

We come now to another Use of the Cabbages, which promise to be of noble Service.—I am now in the feeding Way; as my Land is not at present fit for it; and some other Circumstances conspire against my Stall-feeding any Bullocks or Cows yet.—However, I had furnished a sorry Villain who was a Labourer of mine with a small Cow of the ordinary Kind, in order to give his poor Children a little Milk; and this Cow had the Run of some rough Pasture which is devoted to the Cows of the Labourers.—In September, and the first Week in October, I was confined to my Bed and Room.—On the second of October, a little Farmer of my Neighbourhood came to me with a Complaint against the Bellow and Cow just mentioned.—He told me that the Cow was in better Condition than I imagined, and that if I would take Care of her, she might make miedling Beef by Christmas. In a few Days I was able to ride about the Fields a little, when I looked at the Cow, and ordered

* The Reader is to observe that these are only one Horse Cart.

her into the after Grafs of a little Meadow adjoining the Cabbage field; directing the Man to throw her six or eight Cabbages every Day, which he accordingly did: and soon after, she was in such Expectation of them, that as soon as the Man entered the Cabbage Field with his Cart, she would gallop to the Gate of her Inclosure, with her best Speed.—On the 27th Day of *November* following, it was thought adviseable to kill the Cow, as she began to belly with her Calf. She was accordingly killed, and contrary to all Expectations, she afforded six Stone of Tallow. The Reader will observe she was a small Cow, weighing only 3 C. 3 qrs. 18 lb. and that she was not fed during the Summer, and therefore we could have no Reason to expect much Tallow in her. Six Stone to be sure is not much, but when we consider, that she had not eight Weeks feeding, and *that* only in *October* and *November*, I think it is very strong Testimony of Cabbages being a very fattening Food for horned Cattle, and therefore renders them well worthy the Attention of the Grazier.

The Cabbages already spoken of, began to decay, before the Swine could consume them (except the *Anjou* and green *Savoy*, and therefore, to hasten the Consumption without waste, we were obliged to give them to the horned Cattle in general, until they were exhausted.

In the Course of this Business, it was in general one Horse that drew the Cabbages Home: one Evening as I was standing in the Field, I observed the Horse eating the Cabbages very eagerly, with some surprize I mentioned it to the Man. “Oh Sir,” replied he “the Horse always eats them.”—This to me was a Matter of Curiosity, and I ordered him to change his Horses, and take Notice, whether others eat of the Cabbage also, and they all did.—But as I shall have Occasion to mention this Subject hereafter, I shall conclude upon it for the present.

Variety

Variety of Experiments and Considerations upon the Cabbage Husbandry, as to the Spring or Summer Culture.

We come now to our second Set of Experiments, as the Reader may remember in the entering upon the Cabbage Husbandry, p. 113, I there proposed the dividing the Subject into two Sets of Experiments for the clearer Treatment of it. The Reader will therefore understand that in this second Set, I comprize my experiments in the Cabbage Husbandry, to such alone, as I distinguish under the Head of Spring or Summer Plants, because the Seeds of these different Kinds were sown in the Spring, and not in Autumn.——

The second Set of Experiments upon the Cabbage Husbandry. — Being the Spring or Summer Culture.

The Kinds were as follow.

N^o.

1. The Green Boorcole.
2. The Great Scotch Cabbage.
3. The Anjou Colewort.
4. The Chos du Milan.
5. The Turnep Cabbage.
6. The Jerusalem Colewort.
7. The White Brocoli.
8. The Purple Brocoli.
9. The Green Brocoli.
10. The Red Pickling Cabbage.

Here we have ten Kinds, of which I sowed the Seeds on the 10th of *March*, except N^o. 6, and that I did not Sow until the 24th about a Thimble full of the Seed having been given me the Day before in *Dublin*.—I had likewise, a second sowing of N^o. 7. N^o. 8. and 9, as will hereafter appear.

This

This may not be an improper Place for me to inform the Reader, that in general, I find I have sown too small a Quantity of Seed, to afford Plants sufficient to furnish the Ground which I have intended for their Reception; and that my Experience informs me, one Pound of Seed at least, 20 Ounces I think would be better, should be sown for every Acre *, which is intended to receive the Plants; except the Boorcole, of that 12 Ounces may be sufficient, because the Seed is smaller.—The Seeds should be sown pretty thin, in well prepared Ground: four or five Perch to a Pound I think may do.—In this Case, healthy luxuriant Plants enough will be got, at once to finish the intended Plantation—whereas, when we wait for the further growth of the small ones which are left in the Beds after the first pulling, there is a Difference in the Appearance of our Plantation, which is not pleasant to the Cultivator who shall take Pleasure in looking at it; neither is it so profitable.

But now to return to the Prosecution of this Set of Experiments.—For the Reception of the several Plants already mentioned, I prepared five Plantation Acres of Ground. The Land was ploughed in *November*; again in *April*, and harrowed down. The latter End of *May*, we began to throw it into Ridges of five Feet Breadth, *i. e.* six Sods, or three Boughts of the Plough.

On the 17th of *June*, I began to manure the Ground, by sending the Carriages up the *second* Ridge in the Field, then the *fourth*, and then the *sixth*, and so on; dropping the Dung upon them. Thus every other Ridge in the Field was supplied with Dung, but the remaining Ridges had none at all.

As fast as the Dung was laid out, a Man was employed to divide it, half into one Furrow, and half into the other; thus every Furrow in the Field, received

* It is to be understood, that I mean the plantation Acre of 70,560 Feet.

received an equal Proportion of Dung.—As fast as this Spreading was performed, a Plough followed to cover it, in order to prevent as much as possible, the Quality of the Dung being injured, by the Exhalations which would arise from it very suddenly, at that Season of the Year, when the Parts are so exposed to the Sun by spreading.—In short, it is a Rule with me, and ought to be so with every Body, to keep the Plough close to the Spreader or Spreaders of the Dung, that none of it may be left exposed.

The Reader will readily conceive, that by the present Operations of the Plough, our Ridges are now made over the dunged Furrows, and the Furrows where the Ridges were before.

Thus our Preparation was completed; and I looked with eager Expectation for Rain, that being the critical Moment to furnish the Ground with the Plants.—Accordingly, on the 21st and 24th of June, we had fine Rain. As soon as it began, I set my People to work, and in the two Days already mentioned, I had three Plantation Acres, furnished with *Boorcole*, N^o. 1. *Scotch Cabbage*, N^o. 2. *Anjou Colwort*, N^o. 3. *Chos du Milan*, N^o. 4. *Turnep Cabbage*, N^o. 5. and *Red Cabbage* N^o. 40, but I covered much more Ground with the *Boorcole*, than with all the other Kinds, as I knew how far I could depend upon that; and I had not many *Turnep Cabbage*, as I was doubtful of the Seed, having lost all my own. In future Days, we finished the Remainder, and of the several Kinds in the whole, I had five Plantation Acres under the Spring Plants.

The whole Number of People employed in drawing the Plants out of the Seed Beds, carrying them to the Field, and planting them out upon the three Acres already mentioned, came to eleven Shillings and three Pence, which is exactly three Shillings and nine Pence an Acre; and this was the total Expence in the ordinary Course of Business; but I think, where active handy Men shall be chosen, that three would easily plant out an Acre in a Day.

I think

I think I should not omit to inform the Reader that I adopted an Instrument for putting down the Plants, which greatly facilitated the Operation.—Observing the Men frequently stop to trim the Points of the wooden Dibbers with their Knives, (which the Stones in the Ground and the Soil blunted very fast) and thereby spoiled the Shape of them; and observing also, that some Strength was frequently necessary to force down so light a Tool I conceived both Difficulties might be removed at once, by an heavy Dibber of Iron; as its own Gravity would contribute to its entering the Soil at once, and its Hardness prevent its being blunted by the Stones. I therefore went to my Forge, and had one made immediately, eighteen Inches long, and seven Pounds Weight; brought it to the Field, and put it into the Hand of the Man, who was remarkably slower than the rest in putting down his Plants; this presently enabled him to come up with the other Men, and afterwards, no Man in the Field could keep Pace with him.—Besides adding to the Expedition, the Business is much better done.—This Event induced me to make more of the Iron Dibbers, which we find, answer completely; but if possible, a lazy Fellow will get hold of a wooden one; he not caring to carry seven Pounds in his Hand instead of not so many Ounces, if he can help it; and not using an Iron Dibber is an excellent Excuse for his being far behind his Comrades, of which he will avail himself; whereas, the Reader will readily conceive, that Regularity and steady Perseverance is the Dispatch of this, as well as all other Business; but in this more than ordinary necessary when the Weather serves. The putting down an hundred or two of Plants in a Garden for domestic Use, has often been with me the Work of a Day, when half an Hour honestly disposed would do the Business. When we come to put out Acres, how different then is the Case, and when would the Work be finished, did we not exhortate the Execution by every Means in our Power? and I think, three Shillings and nine Pence for putting out an Acre, which contains about eight Thousand Plants is not to be called expensive (even were it double the Sum) since in the first Case it would not be Sixpence a Thousand and in the second not twelve Pence.

This trifling Expence also shews the false Œconomy of pretending to mark out the Ground with the Plough, to place the Plants in the Furrows, and then throw the Earth to them with the Plough.—Valuing the Labour of the Cattle, the Wages of the Ploughman and Driver, in addition to that of the People employed to lay the Plants in the Furrow, I think I can put out an Acre, or twenty, for at least half, if not a fourth of the Expence.—Besides, the Regularity differs widely, which in Proportion to the Variation from strait Lines, is more or less offensive to the Sight, and it is of great Importance, that the Plants should stand in regular Lines, otherwise the Horse-hoeing cannot be conveniently and safely executed.

I have another Objection to this Use of the Plough : the Ridges cannot be raised for the Reception of the Plants, and therefore there cannot be that Depth of reduced or manufactured Soil for the Roots to play in, that there is, when the Ridges are raised handsomely. Suppose the Staple that our Plough works in to be nine Inches, by throwing it up into these Ridges, I make it eighteen. Suppose the Staple but six, by raising the Ridges, it may still be made near eighteen, by widening the Mould-board of the Plough: The Benefit of this to the Plants must be so obvious to every Man, who thinks, that I need not dwell upon it.—As to putting out the Plants, the Center of the Ridge gives our Line of Direction, provided the Men are properly placed: in a few Words I will describe the Progress of the whole Work, and the proper Position of the Men.—When the Work of planting is to begin, you should have a Fourpenny or Sixpenny Basket for every three Men you mean to employ; one Basket at the Seed-bed filling, and one passing backwards and forwards by a Boy or Girl; all the Baskets being furnished, except one; leave a careful Person drawing the Plants:* proceed to the Field

* This Summer, 1770, I brought some of my Plants to the Field in a one horse Cart, which will be a good Method, particularly when the Plantation is to be at a Distance from the Seed-beds: But then it will be necessary to tie the Plants up in large Bundles.

Field with the loaded Baskets; and for every three Men which are to be employed, let a Boy or Girl drop the Plants single upon the Ridges, as near as he can guess the Distance they are to be planted; he will in general lay them thick enough; but if too thick or too thin, he soon will have Notice from his Set of Men. Place your Men, whatever be the Position of the Field, so that they may work from their left Hand; by this Manner the Position of the Body will be oblique, always inclining the Sight to the Part of the Ridge which is planted; and in Proportion as he advances in his Business, his Line lengthens, and he can the easier distinguish whether, and where he errs, and will immediately correct any Irregularity. If a left-handed Man be in the Field, his Position must be reversed. Thus the Business will go on regularly, and with Expedition, provided the Master, or some trusty Agent do attend the whole Operation. And I may truly say, Expedition is the *Life* of this Business, because when the Weather serves, the Plants will scarcely bend by removing them from the Seed-bed to the Field; but when the critical Time is lost, long Sickness at least attends them, and sometimes Death.

Having thus stated these several Operations, I shall now lay before the Reader the Produce, Duration, and Use of the several Plants before us.

No. 1. The Green Boorcole.—This Plant flourished to a Degree that was truly pleasing to myself, and the many Gentlemen and Farmers who have seen it.—It stands the Winter to Admiration, neither Frost or Snow, appearing to do it the least Injury. The Field made so fine an Appearance all the Winter, that some Gentlemen called it my “Cabbage Cops.”

On the 23d of *April*, I had one Row cut for weighing, which afforded 18 Ct. 26 lb. 8 oz. the Number of Plants in the Row were 380, which is in the Proportion of five Pounds, and six Ounces to a Plant. On the same Day, I had another Row cut and weighed, which afforded 18 Ct. 1 qr. 11 lb. 2 oz. the Number of Plants in this Row were 378; (a Variation which may easily happen
in

in the putting out).—Our Weight is in the Proportion of five Pounds and seven Ounces to a Plant.

I shall add the Produce of these two Rows together, in order to strike the Medium Produce for present and future Calculations. The Produce of the two Ridges then, will be 36 Ct. 2 qr. 9 lb. 10 oz. The Number of Plants 758, the average Weight 5 lb. 6½ oz. to a Plant, some weighed seven and eight Pounds.

Our Ridges are 32 Perches in Length, or 672 Feet, which being doubled (as we have two Ridges before us, and the Number of Plants differ in the Rows) and divided by 758, our Number of Plants in the two Rows, it will appear that each of our Plants occupied about 21½ Inches: A Distance which I find too great, as I shall hereafter explain.—The Medium upon a Ridge will be 18 Ct. 1 qr. 4 lb. 13 oz.

Nº. 2. The Scotch Cabbage.—This Plant flourished very well: closed and hardened earlier than I imagined it would have done. In *December*, the outside Leaves began to decay. On the 10th, I therefore cut one Row of this Cabbage which afforded 20 C. 3 qrs. 5 lb. 14 oz. Our Number of Plants 342, the Average Weight per Plant is 6 lb. 13 oz. Some of them weighed 8 or 9 Pounds. The remaining Plants began to decay in *January*. Our Ridges 672 Feet long, our Plants 342 upon a Ridge, it appears each Plant occupied something more than 23½ Inches in the Rows.

Nº. 3. The Anjou Colewort.—This Plant grew pretty well, but did not answer my Expectations. However, it stood the Winter very well, and on the 27th of *April*, I cut one Row, which afforded 16 C. 3 qrs. 20 lb. 6 oz. Our Number of Plants 341. The Average is therefore 5 Pounds 9 Ounces. The Distance 2 Feet in the Rows. For the Summer Cultivation of this Plant, I think one Foot or 15 Inches in the Rows would be sufficient, and that a greater Weight would consequently be obtained. It is remarkable, that these Summer Plants had shot many more Flowers on the 27th of *April* for seeding, in Proportion

portion to their Weight, than the Winter Plants had done. Indeed now the 25th of *May*, the Latter have thrown out such a Quantity of Flowers as are amazing. From them I mean to save some Seed, as I conceive it to be shameful to be giving 40 Shillings a Pound for it as I have done.

Nº 4. The Chos du Milan, This Plant flourished but indifferently at first. Stood the Winter extremely well. Is an open Plant of a dark Green. Affords excellent Sprouts all the Spring for the Table. Is not yet (1st of *May*) flowered for Seeding.—On the 27th Day of *April* one Ridge of it afforded 13 Ct. 2qr. 27lb. Our Number of Plants 342, the average Weight 4½ Pounds. The Distance in the Rows two Feet. For the Purpose of Winter pasturing Cattle, it will answer very well, and I conceive would afford a good Crop, one Foot asunder in the Rows, and the Rows three or four Feet from each other.

Nº 5. The Turnep Cabbage. This Plant grew worse with me this Year, than ever it did before. The Seed was mixed; however, I had some of the right Kind. The Rust* came upon the Leaves of it, and has always done so, more or less in very wet and cold Seasons; and much injures the Growth. I need not enter into the Uses of this Plant, as I have done that before, in my Report for the Year 1764. On the 27th Day of *April*, I cut one Row of this Plant, which afforded 20 Ct. The Number of Plants 448. The average Weight five Pounds a Plant. Some weighed nine. The Distance eighteen Inches in the Rows. One Foot in the Rows and four from Row to Row I think may do better.

Nº 6. The Jerusalem Colewort. For the Seed of this Plant, we are indebted to *Edmond Sexton Perry, Esq;* a Member of our Society. And it were to be wished that all Gentlemen of Fortune, in their Excursions abroad, would pay the same Attention to the Improvement of

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Agriculture,

* For what I mean by Rust, see my Report 1764.

Agriculture, which this Gentleman's Anxiety for the true Interest of his Country induces him to do.—The Quantity which I got of this Seed was so small, that I could not carry my Culture thereof into the Field; the Plants were therefore put out in the Garden in Rows three Feet asunder, and two Feet in the Rows. Mr. Perry was afterwards so kind, as to give me some Plants out of his Garden, which I put into the Field, but it was too late, and the Weather was dry, so that they were not near so large as those in the Garden. The Plants in the Field were cut by Mistake in my Absence, otherwise I intended to let them stand for Seed. Those in the Garden I must cut, because they are too near some Anjou Colewort which I intend to stand for Seed; and were I to let them both stand, both would be imperfect.

The Jerusalem Colewort began to shoot in *November* which gave me but an indifferent Opinion of it; however, it was only a faint Effort. I was determined to pay due Regard to the Plant, as I found it stood the Frost very well, and therefore it has not been disturbed. It has shot forth some Flowers for Seeding, but by no Means so plentiful as I imagined, from its Appearance in *November*, that it would have done early in the Spring. I have just now (*April* the 30th) cut one Row of these Plants, twenty in Number, and they weighed 1 Ct. 1qr. the Average 7 Pounds a Plant, (some weighed 14½ Pounds.) A Production so much worthy of Attention, that I shall make two Calculations upon it.—First, as to its Produce in Rows 3 Feet asunder, and two Feet in the Rows: And secondly, upon a Presumption, that it had been in the Field with the other Plants, at two Feet Distance in the Rows, upon five Feet Ridges.

The Plants in Rows three Feet asunder, and two Feet in the Rows, occupy six Feet of Ground, each Plant. This being the Divisor of 70,560, *i. e.* the Number of Feet in an Acre, gives in Answer, 11,760, which in this Disposition of them, would be our Number of Plants upon an Acre. This Number then, we are to multiply by 7, that being the Average Weight of our Plants, and our Answer will be 82,320 suttle Pounds or 36 Tons 15 C. a great Object on the 30th of *April*!

We shall now examine, upon a Supposition, that it had been in the Field, at two Feet Distance in the Rows, upon five Feet Ridges. In that Case our Number of Plants would have been 336, which being multiplied by 7, our Answer would be 21C. upon a Ridge.

N^o. 7. The White Brocoli. This Plant flourished very well, but began to run very early; the Leaves suffered, became rusty with the first Frost, and decayed, so that I have no Account of its Produce as it did not stand.

N^o. 8. The Purple Brocoli. This shared the same Fate, but did not go off so soon.

N^o. 9. The Green Brocoli. This was inferior in Size to the other two. Stood equally with N^o. 8.

The second Sowing of these three Kinds, N^o. 7, 8 and 9.

On the 5th of July, I sowed the second Crop of these three Kinds of Brocoli. The latter End of August, I transplanted them in the Field, in which the present Set of Experiments was carried on. They all flourished extremely well, and gave me some Expectations. In January and February, they afforded such prodigious fine Heads, particularly the White and Purple, that it was at some Peril I appeared before the fair Sex at Home and in my Neighbourhood, all raising a Clamour against me, and crying out, what a Sin, what a Shame it was, for me to think of giving such flowering Brocoli to my Cows*. In short,

F 2

My

* A great deal of the like Discourse flew about the lower Clafs of People, for my giving the Cabbages to my Swine; just as if a Man may not raise what he pleases upon his Land, and dispose of it as he thinks proper.

My Brocoli, I was obliged to cut in my own Defence, in order to weigh it, or I suppose I should have but little left, the Heads going away every Day in Baskets full. The Leaves began to decay very fast the latter End of *February*.

N^o. 7. The White Brocoli, *July* sowing. On the 14th of *February*, I cut one Row of this Plant, which afforded 12 C. 1 qr. 21 lb. 7 oz. Our Number of Plants 343. Average Weight 4 Pounds 1 Ounce.

N^o. 8. The Purple Brocoli. *July* sowing. On the 14th of *February*, I cut one Row of this Plant, which afforded 12 C. 4 lb. 9 oz. Our Number of Plants 342. Average Weight 3 Pounds 15 Ounces.

N^o. 9. The Green Brocoli. *July* sowing. On the 14th of *February*, I cut one Row of this Plant, which afforded 10 C. 2 qrs. 17 lb. 8 oz. Our Number of Plants 341. The Average Weight, 3 Pounds 8 Ounces.

N^o. 10. The Red Cabbage. This Plant grew pretty well, did not close so soon as N^o. 2. but at Length became very hard. In *January* the outside Leaves began to decay and fall off, but the Heart remained Sound and Fair. On the 20th of *February*, I cut one Row. The Produce 18 C. 1 qr. 20 lb. The Average Weight 6 Pounds a Plant. Some weighed 9 Pounds. Distance near 2 Feet in the Rows. Eighteen Inches by 4 Feet I think may do as well.

I shall now recapitulate the several Productions, before I proceed to ascertain the acreable Produce, in order to shew at one View, the Produce of each Kind, upon a Ridge of 32 Perches in Length, their *Average* Weight, and their *extraordinary* Weight.

Recapitulation

Recapitulation of the Produce of the ten Kinds of Cabbages from each Ridge 672 Feet long and five Feet wide; with the extra Experiment upon the Jerusalem Colwort, being all Summer Plants, with their Average and extraordinary Weight.

N ^o .	Distance,	Ct. qr. lb. oz.	Aver. lb. oz.	Ext. lb. oz.
1. Green Boorcole.	81½ ln. by 5 f.	18 1 4 13	5 6½	8 0
2. Scotch Cabbage.	23½ ln. by 5 f.	20 3 5 14	6 13	9 0
3. Anjou Colewort.	2 f. by 5 f.	16 3 20 6	5 9	0 0
4. Chos du Milan.	2 f. by 5 f.	13 2 27 00	4 8	0 0
5. Turnep Cabbages.	18 ln. by 5 f.	20 0 00 00	5 0	9 0
6. Jerusalem Colewort. } — an Acre 36 T. 15. C. }	2 f. by 3 f.	00 0 00 00	7 0	14 8
— Ditto.	2 f. by 5 f.	21 0 00 00	0 0	0 0
7. White Broc. 1st sowing.	did not stand	00 0 00 00	0 0	0 0
— Ditto 2d sowing.	2 f. by 5 f.	12 1 21 7	1 1	0 0
8. Purple Broc. 1st sowing.	did not stand	00 0 00 00	0 0	0 0
— Ditto 2d sowing.	2 f. by 5 f.	12 0 4 9	3 15	0 0
9. Green Broc. 1st sowing.	did not stand	00 0 00 00	0 0	0 0
— Ditto 2d sowing.	2 f. by 5 f.	10 2 17 8	3 8	0 0
10. Red Cabbage.	23½ ln. by 5 f.	18 1 20 00	5 0	9 0

I shall now compare the acreable Produce of these ten Kinds of Cabbages under the Summer Culture. We shall first examine our Quantity of Ground in each Ridge, in order to ascertain how many of them will be required to make a Plantation Acre.

I have already said, our Ridges are 32 Perches in Length, which being multiplied by 21, shews they were 672 Feet long; and being five Feet wide; we are to multiply the Length by the Breadth, and our Answer will be 3,360, which are the Number of Feet of Ground in each of our Ridges. This Number is to be the Divisor of 70,560 which are the Number of Feet in a Plantation Acre, and our Answer will be 21 exactly.

Thus

Thus we find, that 21 of our Ridges make a Plantation Acre *. From these Grounds we are to frame our Calculations upon the acreable Produce of the several Plants before us.

Nº. 1. The Green Boorcole. A Ridge of this Plant we have seen afforded 18 C. 1 qr. 4 lb. 13 oz. which being multiplied by 21, our acreable produce will appear to be 19 T. 4 C. 17 lb. 1 oz.

Nº. 2. The Scotch Cabbage. A Ridge of this Plant we have seen, afforded 20 C. 3 qr. 5 lb. 14 oz. which being multiplied by 21, our acreable Produce will appear to be 21 T. 16 C. 3 qr. 11 lb. 6 oz.

Nº. 3. The Anjou Colewort. A Ridge of this Plant we have seen, afforded 16 C. 3 qr. 20 lb. 6 oz. which being multiplied by 21, our acreable Produce will appear to be 17 T. 15 C. 2 qr. 7 lb. 14 oz.

Nº. 4. The Chos du Milan. A Ridge of this Plant we have seen, afforded 13 C. 2 qr. 27 lb. which being multiplied by 21, our acreable Produce will appear to be 14 T. 8 C. 2 qr. 7 lb.

Nº. 5. The Turnep Cabbage. A Ridge of this Plant we have seen, afforded 20 C. which being multiplied by 21, our acreable Produce will appear to be 21 Tons.

Nº. 6. The Jerusalem Colewort. The Produce of this Plant at 2 Feet by 3 Distance, I have already calculated the acreable Produce of. But in order to compare it with

* The Reader will readily imagine, that in framing the Ridges, although I intend them to be 5 Feet wide, or any other Dimensions, yet, that there will be some little Variation in their Size; but we shall upon our Presumption of 5 Feet Breadth be very near the Truth, although perhaps not mathematically exact.

with the other Kinds upon equal Terms, we have seen, upon that Presumption, that the Produce of a Ridge would be 21 C. which being multiplied by 21, our acreable Produce will appear to be 22 T. 1 C. A Produce we may safely calculate upon, since we have in the other Disposition of the Plants, obtained in the Proportion of 36 T. 15 C.

N^o. 7, 8, and 9. The three Kinds of Brocoli I have not calculated upon at all from the first sowing; and therefore I shall proceed to ascertain the acreable Produce of the second sowing.

N^o. 7. The White Brocoli, from the *July*, or second Sowing. A Ridge of this we may have seen, afforded 12 C. 1 qr. 21 lb. 7 Oz. which being multiplied by 21, our acreable Produce will appear to be 13 T. 1 C. 1 qr. 2 lb. 3 Oz.

N^o. 8. The Purple Brocoli from the *July* or second sowing. A Ridge of this we have seen, afforded 12 C. 4 lb. 9 Oz. which being multiplied by 21, our acreable Produce will appear to be 12 T. 12 C. 3 qr. 11 lb. 13 Oz.

N^o. 9. The Green Brocoli from the *July* or second sowing. A Ridge of this we have seen, afforded 10 C. 2 qr. 17 lb. 8 Oz. which being multiplied by 21, our acreable Produce will appear to be 11 T. 3 C. 3 qr. 4 lb. 8 Oz.

N^o. 10. The Red Cabbage. A Ridge of this Plant we have seen afforded 18 C. 1 qr. 20 l. which being multiplied by 21, our acreable Produce appears to be 19 T. 7 C.

Recapitulation

Recapitulation of the acreable Produce of ten Kinds of Cabbages, being Summer Plants.

The Table of acreable Produce.

N ^o .	Distance.	Tons.	C.	qr.	lb.	oz.
1. Green Boorcole	21 $\frac{1}{4}$ <i>ln.</i> by 5 <i>f.</i>	19	4	0	17	1
2. Scotch Cabbage	23 $\frac{1}{2}$ <i>ln.</i> by 5 <i>f.</i>	21	16	3	11	6
3. Anjou Colewort	2 <i>f.</i> by 5	17	15	2	7	14
4. Chos du Milan	2 <i>f.</i> by 5.	14	8	2	7	00
5. Turnep Cabbage	18 <i>ln.</i> by 5 <i>f.</i>	21	00	0	00	00
6. Jerusalem Colewort	2 <i>f.</i> by 5 <i>f.</i>	36	15	0	00	00
— Ditto	2 <i>f.</i> by 5 <i>f.</i>	22	1	0	00	00
7. White Broc. 1st sowing.		00	00	0	00	00
— Ditto, 2d sowing	2 <i>f.</i> by 5 <i>f.</i>	13	1	1	2	3
8. Purple Broc. 1st sowing.		00	00	0	00	00
— Ditto, 2d sowing	2 <i>f.</i> by 5 <i>f.</i>	12	12	3	11	13
9. Green Broc. 1st sowing.		00	00	0	00	00
— Ditto 2d sowing	2 <i>f.</i> by 5 <i>f.</i>	11	3	3	4	8
10. Red Cabbage	23 $\frac{1}{4}$ <i>ln.</i> by 5 <i>f.</i>	19	7	0	00	00

Here we have before us, a compleat Comparative View of the acreable Produce of ten Kinds of Cabbages, in this second Set of Experiments from Summer Plants.

Considerations upon the Duration of the ten Kinds of Cabbages in this second Set of Experiments.

I shall now make some Observations upon the Gradations of Time, in which these ten Kinds of Cabbages will stand, from the Summer Culture of them; for which Purpose I shall divide them into Classes, regulated by their Capability of standing the Severity of the Winter, and then I shall recapitulate, in order to exhibit in one View, by Way of Table, their Duration.

The Clafs which comes first in Decay.

The White Brocoli, N^o. 7. The Purple, N^o. 8. and the Green, N^o. 9. from the *March* fowing, are of the Clafs which first Decay, for we have seen, that the *March* fowing, for the Culture of these Plants answered no good Purpose, for the Farmer or Grazier, and therefore they come properly under this Clafs; and may be for ever hereafter rejected, as to the *March* fowing.

The Clafs which comes second in Decay.

The Scotch Cabbage, N^o. 2. Here we find the Scotch Cabbage, still, even by the Spring fowing, keeps it's Place of being *second* in Decay, and among all the remaining Kinds, stands single in this Clafs: Had any of the flat *Dutch* been sown at the same Time, probably that would have accompanied the Scotch in this Clafs, as it did in the Winter Plants.—However, the outside Leaves fell off in *December*, and the Body began to Decay in *January*.—These Circumstances attending this Cabbage, with the Consideration of the Winter Plants standing near as long, and producing very much more, gives the Preference to the Winter Culture; and at the same Time, indicates very strongly, that we are not to expect Assistance from this Plant longer than *January*, if mine be the true Kind, which the Reader will recollect, I am by no Means certain of.—But although a further Pursuit of this Enquiry should confirm what we here find to be the probable Case, yet, let the Farmer and Grazier consider the Produce of this Cabbage *per Acre*, even until that Time, and he surely will not neglect it, when he sees even the Summer Plants produce above 21 Tons an Acre, and the Winter Plants above 38 Tons. These are noble Resources, either for running Stock or fattening, and which a Man may the safer venture upon, when we have other Plants which will come in Succession after them, until the Month of *May*, and even *June*.—And were we to enlarge upon the Difference of Expence, in using this Food with some Hay or Straw, and using only Hay, the

the Difference would be amazing; and much more amazing that the Cabbage Husbandry has not been universally adopted many Centuries ago.

I have already informed the Reader, that this is the Kind of Cabbage now in most general Cultivation in *England* for the Purpose of the Farmer and Grazier, and I think it may be an animating Consideration to the spirited Lovers of Rural Improvement in this Kingdom, that although my Productions of this Plant have been pretty considerable, yet they appear to be very short, in Point of Weight, with what is produced in *England*, because, from thence they may expect to exceed my Produce—The Difference in Produce, deserves a little further Consideration; that of Duration I touched upon before, p. 153.

I find, according to the Information which Mr. *Young* obtained, that some Gentlemen have had above 50 Tons upon an *Englisb* Acre, and some few as low as 15 Tons. I shall trouble the Reader upon this Point with a Table of Mr. *Young's*; which, from the judicious Manner in which it is framed, and the Names annexed to it, deserves the Thanks of the Publick, not only to Mr. *Young*, but the Gentlemen who furnished him with Information *.

“ *On Clays and strong Loams.*”

“ Mr. Turner, - - - 39 Tons.”

“ Mr. Crowe, - - - 35.”

“ Mr. Scroop, - - - 37.”

“ Earl of Darlington, - 40.”

“ Mr. Dixon, - - - 48.”

“ Average 39 Tons.”

“ *On rich deep light Loam.*”

“ Mr. Tucker, - - - 44 - - 44.”

* See his Six Months Tour. Vol. 4. p. 181.

" *On other inferior Soils.*"

" Mr. Middlemore, - - - 54." *

" Mr. Lyster, - - - 27."

" Mr. Smelt, - - - 18."

" Mr. Scroop at Dalton, - 24."

" Average - 30."

Here we see the Produce of this Plant in *England* upon different Soils, and when we consider the Difference between the *English* Acre, and the *Irish* Plantation Acre, and compare my Produce with theirs, the Difference will be great indeed, even though we only take the Averages given by Mr. *Young*.—This Point deserves some Reflection. I shall only take the Medium of Mr. *Young's* Averages.

" On Clays and strong Loams, Average 39 Tons.

" On rich deep light Loam, - - - 44.

" On other inferior Soils, - - - 30.

The Medium will be above 37 Tons on the *English* Acre upon different Soils. Mine is only 38 Tons upon the Plantation Acre.—Without going into nice Calculations, let us examine the Difference by the common rough Estimate, of 5 Plantation Acres to 8 *English*, without the Fraction of odd Perches; in that Case it will stand thus.

The Medium, upon Mr. <i>Young's</i> Averages,	}	296 Tons.
will, upon 8 <i>English</i> Acres amount to - -		
My Produce, upon 5 Plantation Acres, which	}	190
is equal in Quantity of Ground - - -		

Difference in Favour of the *English* Produce 106 Tons.

This Difference appears to be Extraordinary; however, two Reasons occur to account a little for it, perhaps three.

It

* This Production is prodigious!

It appears I have given my Plants more Room, than the Gentlemen did, who furnished Mr. *Young* with Information as to their Culture of this Plant.—It should seem from this, (and is indeed what I have frequently said in the preceding Sheets) that I have erred in my Dimensions of Ground for each Plant. Strange as it may seem, it is an Error I am proud of; though, if I shall continue in the Prosecution of my Enquiries, I shall correct this Error, and reduce the proper Distances to some tolerable Degree of Certainty by future Experiments.—But for the present, let us examine this Matter a little farther—For this Purpose, I shall extract from Mr. *Young's* Account, some Averages of the Weight of Plants produced by different Gentlemen, and the Distances used by them, for the Scotch Cabbage.

<i>Names.</i>	<i>So'ls.</i>	<i>Average.</i>	<i>Distances.</i>	<i>Quantity of Ground to each Plant.</i>
(a) Mr. Middlemore.	Red Sand.	14 Pds.	18 In. by 4 ft.	- 6 ft.
(b) Mr. Lyfter.	- Light Sand.	9 1 half.	2 ft. by 4 ft.	- 8 ft.
(c) Mr. Tucker.	- Light sandy Loam, extremely rich. Rent 45 s.	}	20 2 & 2 1/2 by 4 ft.	- 8 & 10 ft.
(d) Mr. Ellerker.	- Loam on Chalkstone		14 - 2 by 3 ft.	- 6 ft.
(e) Mr. of Rockingh.	- Rich deep black Loam.	}	no Aver. 3 ft. by 3.	- 9 ft.
(f) Mr. Crowe	- - Clay - -		15 - - 2 ft. by 4.	- 8 ft.
(g) Mr. Smelt	- Sandy Gravel.	7 1/2	- 2 ft. by 4.	- 8 ft.

Here the Reader sees the Average Weight produced, and those Distances chosen by those several Gentlemen *. Mr. *Tucker's* Average *per* Plant is by much the highest, and he allows 8 and 10 Feet of Ground to a Plant, but then much may be attributed to the Goodness of his Land; which

(a)	Six Months Tour.	Vol. 4.	p. 164.
(b)	—	—	p. 165.
(c)	Vol. 4.	—	p. 166.
(d)	One Crop of this Gentleman's have weighed upon an Average 30 Pounds a Plant.		
(e)	—	—	p. 167.
(f)	—	—	p. 169.
(g)	—	—	p. 170.

* I might insert many more from the same Work, but those I have inserted may suffice for our Purpose.

which we see is 45 Shillings an *English* Acre †. None of the rest exceed an Allowance of 8 Feet of Ground to a Plant, except the Marquis of *Rockingham*, his People allow 9, but we have no Average of his. My Average of the Winter Plants ‖ we have seen is 12 lb. The other Gentlemen all exceed mine, except Mr. *Lyster* and Mr. *Smelt*, allowing only 6 and 8 feet to a Plant. We may hence conclude, that mine might have been the same Average, had the Plants been allowed only 8 Feet of Ground instead of 10, which was my Allowance. In that Case we should have had 1764 more Plants upon an Acre than I had, which holding the Average, would have added to our acreable Produce 9 Tons, 12 C. 3 qr. 7 lb. and would have made it 37 T. 16 C. 3 qr. 20 lb. This would be great, but still deficient with the Medium of the Produce of the several Averages stated in p. 221.—So much for the Variation in Distance. Let us now examine another Cause of my Deficiency in Weight.

Another Reason perhaps for this Difference in produce, may arise from the Nature of my Soil: Harsh as a Storm, Steril without Aid, and has been under Persecution, as long as the oldest Workman here can remember, without any Assistance: I have indeed, changed the Face and Nature of a good Deal of it. But when I first talked of having Fields of Cabbages upon it, the Contempt with which my Workmen, and many other Persons looked upon me, is not worth describing.—It is sufficient that they have seen me accomplish my Design.

A third Reason for this immense Difference between mine, and the Produce in *England*, may perhaps arise, from my not having the true Scotch Cabbage, as I before suggested.

However, let us consider the Quantity I have obtained; and surely that will rouse the Attention of those who

† When we examine this Rent, is it not astonishing to find it amounts to 3 *l.* 18 *s.* *Irish* Currency for a Plantation Acre. But we are told it is extremely rich Ground, and indeed so it ought.

‖ See the Table, p. 133.

who have better Land, since 38 Tons, even upon a Plantation Acre is a noble Produce. Look then at the Produce in *England*, and surely the People of this Kingdom will be animated to make such Advantages of their Land, as this Husbandry affords, not only in the immediate Advantage of the Cabbage Crop; but the happy Preparation it affords for Corn, Meadow and Pasture.

The Class which comes third in Decay.

The White Brocoli, N^o. 7. the Purple N^o. 8. and the Green, N^o. 9. from the *July* sowing. These Plants we have seen, stood until *February*; but upon the Whole, when we look at the comparative Produce in the preceding Table. p. 211, and observe how far short their Produce is of the rest, I think, for his Purpose, the Farmer may reject these Plants, and therefore I consider our Enquiry, as to them, perfectly conclusive.—Save what relates to the Circumstance of local Situations, rendering it worth the Farmers while to introduce them as Articles of Husbandry for Sale, of which I should suppose at least ten, if not twenty Pounds an Acre might be made, for it is a Plant that sells High for the Table, to which the Season in which it is obtainable much contributes.—To inform the Farmer a little who is properly situated, let us examine this Object a little further.—Suppose he puts his Plants one Foot asunder in the Rows, and the Rows three Feet, in that Case, an Acre will contain 23,520 Plants. At an Halfpenny a Piece, they would amount to 44*l*. I am told 2*d*. and 3*d*. an Head in retailing them is no uncommon Price. This is a Matter, which seems worthy of Attention I think to particular People.

The Class which comes fourth in Decay.

The Red Cabbage. N^o. 10. Although I bring this Cabbage under this fourth Class, yet I think it would have stood quite sound until *April*, for the last of them were cut in *March*, and were perfectly hard and sound:

However,

However, I can only speak of their Duration for the Time I kept them.—I think they may be of noble Use, although we find neither Cattle or Swine are so fond of them, as of the white Kinds.

The Class which comes fifth in Decay.

The Anjou Colewort, N^o. 3. In my Commencement of this Part of our Enquiry, I adopted the Word *Decay*, which was very applicable, I therefore continue it here, although I cannot say it is truly adapted to this Plant, which we have seen stood the Winter very well, and all through *April*.—But then began to run.—Even in that State, it affords good and plentiful Feeding for Cattle. But we have already seen these Spring Plants shoot earlier than the Winter Ones. However, it may I believe, be safely depended upon through *April*.

The Class which comes sixth in Decay.

- The Green Boorcole, - N^o. 1.
- The Chos du Milan, - N^o. 4.
- The Jerusalem Colewort, - N^o. 6.

Here our Word *Decay* will again appear to sound improperly, the Reader's Indulgence will admit the former Apology.—I shall examine the Merit of these Plants, in Point of Duration, distinctly.

N^o. 1. The Green Boorcole, stood the Winter without receiving the least Injury, save, that the Summer Growth of Leaves fell off by Degrees in *December* and *January*, but but then a fresh Growth succeeds all the Winter, inso-much, that it appears in this Plant, we have a constant Winter Vegetation going on; a Point which has been indefatigably sought for this seven Years past, although in my Report for the Year 1764, I gave the Publick the same Information.—A Point said to be obtained in *Burnet*;

net; the love of Novelty, a populous Situation, and busy Panegyrist, propagated this Idea to the great Advantage of Mr. *Rocque*, who I am told made two or 3,000*l.* by vending the Seed.—But all the Mountains have shrunk to Mole-hills.—I admit the Burnet does vegetate in the Winter, but it is so trifling, that the Dependance upon it for *Winter* Pasture, would be like feeding Elephants upon Eggs.—Besides which, in an Infinity of Places, it is certain the Cattle refuse to eat it. I am sure I could produce at least thirty Letters from Gentlemen of known Probity and Honour of this Fact; and the same has been found in many Places in *England*.

Now, on the 30th of *April*, the Boorcole has not shot forth any Flowers for seeding; this Circumstance, and that of it's vegetating all the Winter, are Points which come so powerfully in Recommendation of this Plant, that it's inferior Produce is fully compensated by the Season in which it affords it's Produce; above 19 Tons an Acre. A Resource of Food more valuable in the Month of *April* and beginning of *May*, than three Times the Quantity in any other Months of the Year.

Nº. 4. Chos du Milan. This Plant we find, from the Summer Culture answers well in Point of Duration. *April* the 30th it has not shewn any Disposition to Flower for Seeding: That is a Recommendation of it, although it's Produce has been only about 14 Tons an Acre.

Nº. 6. The Jerusalem Colewort. This Plant we find stands the Winter well, is very luxuriant; but from the faint Efforts which it made (as before mentioned) in *November* to Seed, is a strong Indication that it has the same Abhorrence of an Autumn sowing, as did before appear the Boorcole has. We have seen that on the 30th of *April* it had shot some Flowers for Seeding. Upon the Whole, this Plant promises noble Use, which greatly increases the Obligation of the Publick to the Gentleman who brought it to *Ireland*; and for the Information which I have obtained by it, I return him my sincere Thanks.

*The Class which comes seventh and last
in Decay.*

N^o. 5. The Turnep Cabbage. This Plant stands firm during the Winter, and affords we have seen about 26 Tons an Acre this Year. On the 27th of *April*, some Flowers had shot for Seeding; the Turnep is nevertheless Sound, will remain so until the latter End of *May*. But it may be remembered, that in my Report for the Year 1764, I advised the taking up this Plant, and throwing it upon a bare Pasture, where it will keep a Year; though we never can wish to keep it longer than *June*.—This Quality of keeping, gives it the last Place in Duration.—In weighing these Plants, they were thrown from the Scale into the Yard, when the Swine eat them with eagerness.

By reviewing these Considerations, upon the Object of *Duration*, I shall frame a Table which I hope will be useful to the Reader.

Recapitulation of the different Classes of Cabbages, from the Summer Culture, regulated by their Capability of standing the Winter.—Or,

The Table of Duration.

The Class which comes first in Decay.

N ^o . 7. White Brocoli,	} <i>March sowing, worth nothing for our Purpose.</i>	<i>Duration.</i>
8. Purple Brocoli,		
9. Green Brocoli,		

The Class which comes second in Decay. Duration.

Nº. 2. The Scotch Cabbage. - - - January.

The Class which comes third in Decay.

Nº. 7. The White Brocoli, }
 8. The Purple Brocoli, } July sowing. { February.
 9. The Green Brocoli, }

The Class which comes fourth in Decay.

Nº. 10. The Red Cabbage. - - - March.

The Class which comes fifth in Decay.

Nº. 3. The Anjou Colewort. - - - April.

The Class which comes sixth in Decay.

Nº. 1. The Green Boorcole. - - } May.
 4. The Chos du Milan. - - } May.
 5. The Jerusalem Colewort. - - } April and May.

The Class which comes seventh and last in Decay.

Nº. 5. The Turnep Cabbage. Provided it } - June.
 be taken up as directed. - - }

Before I proceed to give any Account of the Uses to which I converted these several Plantations of Cabbages, I shall make some general Observations, which I think will come better by themselves, than had I done so when treating of the Produce, &c. and I hope they will be useful to such Persons as may embark in this Species of Husbandry.

Some

Some General Observations to be considered under the following Heads.

1st. Observation. Considerations upon Boorcole and some other Plants dropping off in the Winter, their Leaves of the Summer Growth.

2d Observation. Considerations upon the great Height of the Anjou Colewort, as to its Use for feeding Sheep.

3d Observation. Considerations upon the Shelter and Pasture which these kind of open and lofty Plants afford for Sheep, as Objects of great Moment.

4th Observation. Considerations upon such Plants as admit of being put out in the Spring, and latest in the Summer.

5th Observation. Considerations upon such Plants as admit of standing latest in the Spring, as a Point of the utmost Consequence.

6th Observation. Considerations upon the Succession of the several Kinds, so far as our Experiments afford Information.

7th Observation. Considerations upon the Distance of planting Boorcole and other Cabbages.

8th Observation. Considerations upon the Misfortune to which we are liable, in having our Turneps and Cabbages stolen.

1st Observation. *Considerations upon Boorcole, and some other Plants dropping off in the Winter the Leaves of the Summer Growth.*

Under this Head, I shall only consider such of our Plants as stand the Winter through; and of those, only such as we have seen are most profitable in the Course of our Experiments. And therefore, in this Place I have only to take Notice of the *Boorcole*, the *Anjou Colewort*, the *Turnep Cabbage*, and the *Red Cabbage*; these I think are the only Plants which stand until Spring, and that cast their Leaves, of the Summer Growth.

The *Boorcole* I have already said, stands the Winter admirably, and as it casts the Summer Leaves in *December* and *January*, proceeds in Vegetation, and produces another Succession of Leaves, not so large, but infinitely more in Number.

With me, all the Summer Leaves dropped off, and consequently were lost, but that need not be the Case with other Cultivators: I thought it necessary for the Information and Conviction of the Publick, to let this whole Plantation stand, without any Diminution but the natural One; but other Cultivators need not do that: They cultivate for the most profitable Use,—I for their Information, and to guide them to that Profit; I still think, as I did in the Year 1764, that the most advantageous Way of using this Plant, would be by turning their Sheep into the Field, as I have therein described*. By that Means, the Summer Leaves will be turned to Profit, which cannot answer any other Way, as the pulling and bringing them Home would be too expensive, because it must be all Hand-work and Man's Carriage to the Head Lands, as no Carriage can be admitted amongst the Plants, the Intervals being too narrow.

* See my Report for the Year, 1764. p. 29.

The Anjou Colewort casts it's Summer Leaves in *November* and *December*, but will be handsomely furnished again by the Winter Growth against the Spring. The same Objections hold good with Respect to making Use of the Summer Leaves by carrying them off, as I have just offered to the Boorcole; and therefore this Plant should also be pastured by Sheep, to prevent the Loss of the Summer Growth; the Practice of which will be further considered under our second Observation presently.

The Turnep Cabbage likewise cast it's Summer Leaves, as I fully mentioned in my Report for the Year 1764. These *must not* be pastured by Sheep for the Sake of making Profit by the Summer Leaves, because the Sheep will most assuredly wound the Turneps of which they are very fond. But the Leaves may all be converted to good Uses, by the Method I have clearly described in the same Report, p. 24.

The Red Cabbage we have seen, also casts it's external Leaves, and where the Cultivator is disposed to adopt the same Method of fetching them as is recommended for the Turnep Cabbage, he need not lose them, but on no Consideration must Sheep be turned amongst the Cabbages, for if they are, they will do more Harm to the Body of the Cabbages, than the Leaves will be worth.

2d Observation. *Considerations upon the great Height of the Anjou Colewort, as to it's Use for feeding Sheep*

The extraordinary Height of this Plant. I should fear would be some Impediment to it's being Pastured by Sheep, (I mean the Winter Plants) as I suppose they cannot reach above four Feet high; where the Plants shall be only Five, that would be no Impediment, but when they shall arrive to seven or eight Feet, as I now have them, I fear it will be some Objection. At the same Time,

Time, I must not omit to observe, that perhaps, that Circumstance may turn out to be useful; for I observed that the Bulk of the Summer Leaves which fell off in Winter, were chiefly those about four Feet up the Stem; those above that Height, seem in general to stand the Winter.

3d Observation. *Considerations upon the Shelter and Pasture which these Kind of open and lofty Plants afford for Sheep, are Objects of great Moment.*

Next to plentiful Pasture, I hear the Graziers always talk of good Shelter. In Plantations of *Boorcole*, *Anjou Colewort*, and *Jerusalem Colewort*, we have a Profusion of Pasture, and Shelter beyond Conception, for Sheep and Lambs; and we have them both at a Season when they are most wanting, and when they can scarcely be had spontaneously upon any Grounds; and more particularly the Pasture. Were there no other Considerations but these which relate to Sheep, to recommend the Culture of these Plants to Land-holders, I should conceive them to be sufficient; but when we add to the Account, the many other Advantages, I live with Hopes of seeing a general Spirit rise through the Kingdom in adopting this Husbandry.

4th Observation. *Considerations upon such Plants, as admit of being put out in the Spring, and latest in the Summer.*

The Convenience which arises, in judiciously considering the Choice of Plants which admit of being put out in the Spring and latest in the Summer, are of such Moment, that no Man, until he comes to the Practice of this Species of Husbandry can conceive it. Suppose any Grazier determined to have 20 or 30 Acres of Cabbages in a Season; would it not be material for him to know how to choose the proper Kinds? For having so many Cabbages would be to have but little, if he had them

them to go off early. Would it not be an immense Work to put them out in a Week or ten Days in *June*? How much greater will it be, when we consider the Importance to this Business, of a wet Day or two at the critical Time, in which we may be disappointed. How happy is it then, that we have such a Variety of Plants, that 10 or 15 Acres may be put out in Spring of Winter Plants, of the most luxuriant Kinds when the Weather generally serves, and which will stand until the *January* following; and that, to come in after they are exhausted, ten Acres may be put out in *June* or *July*, of such Kinds of Spring Plants as will stand until *April*, *May*, and *June*.

For the *August* sowing and Spring planting, we have seen that the *Long-sided Cabbage*, the *Flat Dutch*, the *Scotch Cabbage*, and the *Anjou Colewort* answer best. For the *March* sowing, and Summer planting, the green *Boercole*, the *Turnep Cabbage*, *Jerusalem Colewort*. Even the *Cheer du Milan* appears not unworthy: And even the three Kinds of *Brocoli* admit of being put out so late as *August*. A Circumstance which would render them worthy of Attention, although less in point of Produce, were we not bless'd with Kinds more robust and bountiful in their Nature.

5th Observation. *Considerations upon such Plants as admit of standing latest in the Spring, as a Point of the utmost Consequence.*

The important Point of this Husbandry, depends upon the Care which is taken in the Choice of the Kinds of Cabbages which will stand latest in the Spring; I may almost say, the whole Success depends upon this Point; and therefore I earnestly recommend to the Reader, who shall look into this Book for Information, that he attentively examines my two Tables of Duration, p. 73. and p. 99. and the Observations from which those Tables are framed.—There I trust he will find as much Information, as will at least prevent his going astray if he follows it; as that he may have resources of Food for his Stock

Stock, and not only through the Winter, but until *April* and *May*: And my Experience informs me, that no Season in the whole Year is so distressing to carry on a Stock, Large or Small, as the Months of *March*, *April* and the Beginning of *May*; and I believe all other Persons find the same Difficulty.

Besides, as soon as the Month of *March* is turned, I observe dry Fodder is not so desirable to the Cattle; the long Days, and penetrating Winds, give such an Harshness to the Fodder, that the Cattle are either disgusted at it, or they hanker after green Food.—Another Circumstance perhaps, contributes to this Distaste to the dry Fodder, and Desire for Green: Although at this Time our Fields will not afford Maintenance to Cattle, yet there will be some Spring of Grass in them, and also upon the Verge of Roads and Ditches; this Spring of Grass wherever the Cattle can come at it, they devour immediately; and I presume the Taste of it is so grateful to them, although insufficient in Quantity, that we may naturally suppose the dry Fodder is thereby rendered the less palatable to them. Is it not then, an Object highly worthy of Attention, the making Provision of this Kind for that Season? How mightily does the Value of the Object increase, when we consider the Difficulty there is in providing (abstracted from the heavy Expence of it) sufficient dry Fodder to maintain a large Stock of Cattle through a Winter. And when we add the other Considerations, of being enabled by this Husbandry to carry on fat Sheep all through *April*, plentifully feeding Ewes and Lambs, increasing our Number of Cattle, and thereby our Manure, and highly preparing our Land for Corn or Meadow, or indeed for both, at the Discretion of the Occupier, I cannot be divested of the Hope of seeing the Cabbage Husbandry come into general Use.

6th Observation. *Considerations upon the Succession of the several Kinds of Cabbages so far as our Experiments afford Information.*

The proper and regular Succession of the most profitable of the Cabbage Tribe, is an Object of great Moment, which perhaps requires an Experience, that no Man can boast; and I shall pretend to determine this Point no farther than my Experiments afford Information. To this End, we must take a Review of the preceding Pages, where we find, that the *Long-sided Cabbage*, the *Battersea*, the *York*, and the *Sugar-loaf*, come first into Use, so early as *August*, and continue so until *October* and *November*, for the Purposes of maintaining Swine, fattening horned Cattle, and (although I had none) I may add Sheep. The Use of these Plants for Swine, I shall have Occasion to say something of hereafter. We have seen that the *Long-sided*, produced more than double the Weight of either of the other three upon an Acre of Land *, we can therefore be at no Loss, as far as our Information goes, in choosing them as our first Crop, although we have seen, that they are early Candidates for Putrefaction. The Seed we have seen to be sown in *August*.

The second in Rotation, as to their Capability of standing the Winter, we have seen are the *Flat Dutch*, and the *Scotch Cabbage*: These come into Use in *December*, and stand until *January*, and are both excellent of their Kind, and plentiful in Produce. Their Seed to be sown in *August*.

The third in Rotation, we have seen, are the *Anjou Colewort*; and the *Green Savoy Cabbage*. These are ready for Use in *February*, when the second Class are exhausted, and stand, we have seen until *April* and *May*. But as there appears to be a material Difference in the

* See the acreable Produce, p. 67.

the Product of these two, no Hesitation can be made in choosing the *Anjou*. The Seed to be sown in *August*.

The Reader will observe, that these are all of the first Set of Experiments, being Winter Plants, to be put out in the Spring.

In Aid of these, we have other Successions, of admirable Use, from our second Set of Experiments being Summer Plants.

The *Scotch Cabbage*, the *Red Cabbage*, the *Anjou Colewort*, the *Green Boorcole*, the *Chos du Milan*, and the *Jerusalem Colewort*. But by referring to our Table of Produce, p. 90, and the Table of Duration, p. 99. We shall at once be directed in our Choice.—The *Green Boorcole*, the *Turnep Cabbage*, and *Jerusalem Colewort*, seem then, most entitled to our Attention; and I think the *Scotch Cabbage*, though of this last, I would rather increase my Quantity, from the *Winter Plants*, as by our Winter Table of Duration, p. 73. It appears they stand equally with those in our Summer Table of Duration, p. 99. Besides, where you have your Ground ready prepared, it is of Moment to extend the Spring planting, to the lessening of the Summer planting; the Latter depending much upon the having sufficient Rain in due Time, as I before suggested; and it should always be an unalterable Maxim with the Farmer to leave as little of his Affairs to Chance as he possibly can.

The *Green Boorcole* we have seen is firm against all Attacks of the Winter. The *Turnep Cabbage* of no less Merit, and what seems to add much thereto, is the Important Object of this Plant, admitting of being taken up in *February* or *March*, and kept for Use, without sustaining Injury; so that our Ground after having done it's Office in producing this Plant, may be immediately prepared, only by ploughing twice, and harrowing, if required, for the Reception of another Crop of Cabbages, of *Winter Plants*; a Circumstance so striking in it's Importance, that I need not enlarge upon it.

The

The *Jerusalem Colewort* we have seen, although some faint Efforts were made in *November* to blossom for seed-ing, stands the Winter well, produces greatly in *April* and *May*, and therefore is amply entitled to a Place in the following Table of Successions.

From these Considerations, I shall endeavour to frame a Table of Successions, for the Information, and readier Convenience of such of my Readers, as shall adopt this Species of Husbandry.

The

The TABLE of SUCCESSIONS,

To direct the Choice of Species and Seasons, for the Advantageous Progress of the Cabbage Husbandry.

SPECIES.	SOWN.	PLANTED.	When in USE.	DURATION.
The Long-sided Cabbage.	- - -	In March.	In August.	Until November.
The Flat Dutch Cabbage.	- - -	In March.	Dec. and January.	Until January.
The Scotch Cabbage.	- - -	In March.	Dec. and January.	Until January.
The Anjou Colewort.	- - -	In March.	Dec. and May.	Until May.
The Green Boorcole.	- - -	In June.	Dec. and May.	Until May.
The Turnep Cabbage.	- - -	In June.	February and June.	Until June.
The Jerusalem Colewort.	- - -	In June.	Dec. and May.	Until May.

By this Disposition of our Cabbage Crops in sufficient Quantities, we see, that we should have them from the Time of our Grafs and Clover being diminished, until we can have those two Resources again in Plenty. Surely no Consideration can so much recommend this Husbandry.

7th Ob-

7th. Observation. *Considerations upon the Distance of planting Boorcole, and other Cabbages.*

To ascertain the proper Distances for planting the different Kinds of Cabbages, is a Point worthy of serious Consideration. I shall not pretend to be peremptory in a Point of so much Consequence, but shall only lay before the Reader, such Information as I conceive will probably be the best for his Guidance.

I have before said, that I apprehend I have erred in the Proportion of Ground, which I have allowed to each Plant; p. 94. It is an Error, however, as I conceive, to be of the right Side, where extravagant Extremes are not run into.

It will however, be necessary for me, to offer something upon this Head, until further Experience shall afford more accurate Information.—I shall only touch upon such Plants as are chosen in the preceeding Table of Successions; that will be some Guide to those who may be disposed to continue any of the other Kinds, which are rejected by the Table of Successions.

The long-sided Cabbage it may be remembered, was in Rows five Feet asunder, and two Feet in the Rows, which is an Allowance of *ten* Feet to each Plant. I think much less for this Cabbage would be insufficient, because the Leaves of it extend to a great Breath. However, if two Feet by four shall answer as well, as perhaps it may, our Produce would be considerably augmented; and in this Case, each Plant would occupy *eight* Feet. Or perhaps it might be quite as good a Disposition to put them in Rows five Feet asunder, and the Plants eighteen Inches in the Rows; in that Case, each Plant would occupy only *seven Feet and an Half*. Let us examine what would be our Increase Number of Plants, and probable Augmentation of Produce, under these two Changes of Disposition, or Allowance of Ground to our Plants.

Each Plant occupying ten Feet, the Number
upon an Acre will be - - - 7056
Each Plant occupying eight Feet, the Number
upon an Acre will be - - - 8820
Each Plant occupying $7\frac{1}{2}$ Feet, the Number
upon an Acre will be - - - 9408.

We have seen that the Average of my Produce, was twelve Pounds $1\frac{1}{4}$ Ounce to a Plant. If in the above Disposition of the Plants, the Average shall turn out to be the same; our acreable Produce will be agreeable to the following Sketch of Disposition, Numbers increase, and Augmentation of Weight, the latter of which is of such striking Importance, that both the Dispositions of Distance, are well worthy of careful Trial.

Allow- ance to each Plant.	Num- ber of Plants.	Increase of Plants.	Average		Produce					Augmentation of Produce.				
			Weight.		T.	Ct.	qr.	lb.	oz.	T.	Ct.	qr.	lb.	oz.
10 feet.	7056	—	12	1 ¹ / ₄	38	1	0	18	4	—	—	—	—	—
8 feet.	8820	1764	12	1 ¹ / ₄	47	11	0	27	1	9	10	0	8	13
7 ¹ / ₂ feet.	9408	2352	12	1 ¹ / ₄	50	14	2	7	0	12	13	1	16	12

The same Reasoning will hold for the *flat Dutch* and *Scotch Cabbages*; which I think, from the Firmness of their Heads, and less spreading of their Leaves, will admit of the Distance just stated, better than the long-sided. Whether the average Weight will be the same, as the Distances which I did allow to these Plants, Experiment alone can determine. Where the Cultivator shall be disposed to continue the Spring Culture of either, or both these Kinds, I think four Feet by eighteen Inches, may answer very well, because our Tables of our acreable Produce and Average of the Spring Plants, p. 87, and 90 shews, they are not equal to the Winter ones, see the Table, p. 62, and 67, and therefore will admit of less Room.

The *Anjou Colewort*, when the Seed is sown in *August*, I think may answer very well in *five Feet Rows*, and *two Feet* in the Rows. When sown in *March*, and planted in *June*, I conceive will produce much more than it did with me, by being put *one Foot* asunder in the

the Rows, and the Rows *four* Feet. If the average Weight in either or both these Cases, shall be the same as I had them, see Table, P. 62 and 87, the Increase of Produce would be very great, as any one may easily calculate.

The *Green Boarcole*, and *Turnep Cabbage*, I am inclinable to believe, will be nearly the same Average per Plant, as I had them, see Table, Column, Average, P. 87, if they are put *one* Foot asunder in the Rows, and the Rows *four* Feet. In these Cases, our Increase of Produce would be very great, and more valuable than in any of the former Kinds, on Account of the Season to which we have seen these Plants will stand. It will be hardly necessary, for me to calculate the Increase upon these Plants, as I have already done it upon one Plant in the Course of this Part of our Enquiry.

Under this View however, we must not forget, that by thus increasing our Number of Plants, we almost double our Expence of putting them out, and use many more. A Trifle! if we can obtain only half the Increase of Produce, which would appear upon Calculation at our Averages of the past Year.

The *Jerusalem Colewort*, we have seen produced above 36 Tons per Acre, each Plant occupying *five* Feet, they being *two* Feet by *three*. But in this Disposition of the Plants, we cannot conveniently horse-hoe them. I should therefore prefer their being in Rows, *four* Feet asunder, and the Plants *eighteen* Inches in the Rows, which is giving each Plant, just the same Quantity of Ground, i. e. *six* Feet. The Ground now under them, *May* the second, in *three* Feet Rows, and *two* Feet asunder in the Rows, is *entirely* covered with the Plants, so that it would be hard to force one's Way up the Intervals.

From these Considerations, I shall endeavour to frame a Table of *Distances*, for the Information, and readier Convenience of the Reader. But I beg it may not be forgotten, that I am by no Means peremptory in this Point; I only mean to furnish such Information as my best Experience and Observation suggests.

The TABLE of DISTANCES, for the Cabbage Husbandry.

Experiments on Cabbage.

SPECIES.	Season.	Distance I have used.	Distance I venture to recommend.
The Long-sided Cabbage.	Winter Plants.	2 ft. by 5.	2 ft. by 4. or 18 In. by 4 ft.
The Flat Dutch Cabbage.	Ditto.	2 ft. by 5.	2 ft. by 4. or 18 In. by 4 ft.
Ditto.	Spring Plants.		18 In. by 4 ft.
The Scotch Cabbage.	Winter Plants.	22 ft. by 5.	2 ft. by 4. or 18 In. by 4 ft.
Ditto.	Spring Plants.	23 1/2 In. by 5 ft.	18 In. by 4 ft.
The Anjou Colewort.	Winter Plants.	4 ft. by 5.	
Ditto.	Ditto.	3 ft. by 5.	2 ft. by 5.
Ditto.	Spring Plants.	2 ft. by 5.	1 ft. by 4.
The Green Boorcole.	Spring Plants.	2 1/2 In. by 5 ft.	1 ft. by 4.
The Turnep Cabbage.	Spring Plants.	18 In. by 5 ft.	1 ft. by 4.
The Jerusalem Colewort.	Spring Plants.	2 ft. by 3.	18 In. by 4 ft.

8th Observation. *Considerations upon the Misfortune to which we are liable, in having our Turneps and Cabbages stolen.*

This is a Circumstance no less grievous, than it is aggravating: A Point which I had much rather let alone, than enter upon; but really, I have bore Outrages of this Kind so long, and found every Means which I have hitherto used to lessen so infamous a Practice, so ineffectual; and the Depredations still increasing upon me to a most extravagant Degree, that I own my Patience is worn out.—I hope other Parts of the Kingdom are not so liable to these Practices, as the Neighbourhood I live in; which for stealing Corn *, Grass, Hay, cutting Fences, Sheep-stealing, and other Violences of a similar Nature, exceed any Thing I have ever seen or heard of in that Way. The whole Invention of the lower People here, is to contrive Ways and Means, how they can most dextrously plunder those who have any thing to lose; and could they but burn or eat Stone Walls, I should expect only few would be left in the Country. There is such a Lassitude in the magisterial Execution of the Laws, such Influence and Chicanery to elude them, such seeming Timidity excited by the Mob, and the Laws themselves are so feeble and insignificant, for all these Trespases, (except Sheep-stealing, and for that they are not executed, of which we have at this Moment a recent and scandalous Instance) that it is a mere Joke for a Man to pretend to punish any Person for committing them †. Is it not a shocking Consideration, that to attempt to punish, would be to inform the Vulgar, that it is very little that can be done to them for these petty Offences? and therefore it is more prudent to threaten, than to prosecute.—It is true, an Action might be brought for the

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Trespases,

* I have had the Ears of near two Acres of Wheat thorn in a Night. whilst the Corn was standing.—The Quantity is a Proof that a plurality of Persons were concerned in it.

† A Fellow in League with a domestick Servant of my own, to rob me, which they did pretty handsomely, and from whom I bought my own Oats (taken by them out of my Granary) three Times, had the Influence, by Means of the Interest of an *Huntsman*, to get the Bill of Indictment against him thrown out.—Can any Thing be more insolent to the Laws of a Country, than for any Man to attempt the making Interest with a Grand or any other Jury?—None but the corrupted can attempt to corrupt.

Trespass, a ridiculous Remedy against a Thief and a Beggar.—I used to disregard the losing a few Tons of my Turneps * and Cabbages, whilst I imagined the People eat them ; but now, that some steal them for Market, and that the Cows in many of the Cabbins about me, are fed with the Produce of my Labour and Expence, the better Part of the Winter, I own I think it past enduring ; and I conceive calls aloud for Redress ; not more indeed, than the barbarous Practice of cutting Fences ; for by the cutting Sixpence Worth of Fire-wood out of mine, or any other Man's Fence ; he, or I may, (and consequently the Publick) lose twenty Pounds worth of Corn, and that, after nursing a Fence perhaps twice seven Years.

It is I think Felony for a Man to cut a Timber Tree in the Night. Did I not abhor that Law of my Country, which ventures to take away the Life of a Man, for Offences against Society, I should perhaps wish to see these shameful Depredations punished in the same Manner ; but I cannot be reconciled, for an Infinity of Reasons to such Punishment ; I should rather say, such a Latitude of the human Will : To me it appears horrid in every Stage of it, and highly repugnant to every Principle of national Economy † ; and therefore I should be sorry, as I always
am,

* A poor, but very spirited ingenious Man in my Neighbourhood, who holds about 50 Acres of Land, had Resolution to highly prepare two Acres for Turneps, which proved a very fine Crop, but most of them were stolen from him. I dare say he would soon have trebled this Cultivation might he have enjoyed his Property. Here is a manifest Injury to the Community.—I know many others who offer the like Circumstances, as Objections to the Cultivation of such Plants.

† It appears that the great Sir *Thomas Moore* was of this Opinion ; and as he was at the Head of the Law, and is said to have known and well considered our Laws, I may escape Censure, when I follow the Opinion of so great and so good a Man. *Eutopia*.

A modern Writer, in my Mind, of great Merit, and clear Judgment, breathes the same Spirit.—Letters upon the present State of *France*, compared with *England*.—And if I remember right, the celebrated *Montesquieu* holds the same Sentiments, in his Spirit of Laws.

am, to see any new Laws of Death.—But as the Improvement and high Cultivation of the Lands of this Kingdom, is the *only Source* from whence every Plenty, and every Happiness can flow to her Inhabitants, I hope, most ardently do I hope, that our Legislature will take these Kind of petty Offences under their serious Consideration, so as to protect the Property of Industry, and Production of Improvement. Punishments sufficiently terrifying might be framed, as I conceive, infinitely short of Death, and in my Mind much more effectual, and useful to Society.

Some Account of the Uses, to which the Cabbages produced from the Summer Plants, were converted, with occasional Observations.

I shall now close my Report of the Cabbage Husbandry for the Year 1769, with some Account of the Uses I made of the several Plants already spoken of, under the Spring Culture; the Consumption of the Winter ones I gave an Account of before; in the Conclusion of my first Set of Experiments.

I before said, that the Bulk of my Plantation was covered with the Boorcole, as I knew how far I could depend upon that. When the Scotch Cabbages from the Summer Plants, and my Turneps were exhausted, I then had recourse to the Boorcole, and other Plants, of which I had in all, five plantation Acres, four of them under Boorcole. With this Provision, I maintained 42 Head of horned Cattle, and 43 Head of Swine until the 7th of May, over and above what had been stolen. For two Months of that Time I have not had the least Assistance of any Kind, being totally out of Straw, and our Hay has run so short for the Horses, that none could be spared for the horned Cattle, during that Time.

I mention this Circumstance of being out of dry Fodder to shew that the Cattle will do very well with these

these Articles of Winter Food, but I would not be understood to exclude the Use of dry Fodder, particularly when the Weather is cold and wet; I should wish to give the store Cattle a little Straw once a Day, and Cabbages twice a Day.

The Reader will recollect, that in this Way of using such Productions, I keep the Cattle in general, bailed up Day and Night (save for two or three Hours we turn them out.) The collecting great Bodies of Manure being my *principal Object*. When that is obtained, if it is judiciously disposed of, the great Specifick (if I may so call it) of the Farmer is acquired: any Thing, a Degree above Idiotism I conceive may accomplish almost every Thing else, if Money be ready.

Whilst the milking Cows were allowed Hay in a Morning with Cabbages twice a Day, we found the Milk and Butter very good; but when they came to be deprived of Hay, and lived wholly upon the Cabbages, the Butter had a Flavour which was distinguishable, though not very disagreeable. This Hint however informs us, that for the goodness of Cabbage Butter (if I may so call it) it will be proper to give the Cows some Hay.

Though I have mentioned Straw to be given once a Day to the store Cattle, when Cabbages shall be the Bulk of their Food, yet I would not have it apprehended as being absolutely necessary, particularly, when *Boorcole* shall be the Food. That is a very warm and dry Plant, charged with but little Water, when compared with Turneps, with which *they* abound.

This Consideration renders Boorcole, so manifestly, more than ordinary valuable for Sheep, that I need not enlarge upon it.

The *Turnep Cabbage* is of the same Nature. The *Clos du Milan* likewise. The Jerusalem Colewort seems to be more watery; however, my Quantity was so small, that

that I cannot pronounce as to its Merit for Pasture.— It is remarkable, that walking by the Stumps to Day, which remained of the Plants I had cut Yesterday, I observed all round them, the Ground to be very wet, as broad as the Circumference of a Plate, as if they had been watered, notwithstanding the two Days have been remarkably dry, attended with parching Winds. At first Sight, this Appearance of Wet surprized me; but upon examining the Matter, I found it was the Fluid, collected by the Roots, ascending upwards, bringing Home the Food which used to nourish the Plants: the superior Parts being cut off, the Fluid overflowed, where the amputation had been made, and so returned to the Earth. I was so pleased with the Observation, that I went to the large Field to examine the Stumps there, and I found the same Appearance, only in a less Degree; proportioned perhaps to the Size of the Plants. This Subject opens a large Field for Speculation, but requires such a Latitude, and admits of such Variety of Reasoning, that I cannot find Room here for it. The judicious Reader will draw his own Conclusions from the Appearance.

As to the *Anjou Colwort* I cannot pronounce upon its Quality, because I had not enough of it, to feed my Cattle or Swine any considerable Time upon it: however I believe it contains more Water than the Boorcole.

It would afford me great Pleasure, could I furnish the Reader with a Table, exhibiting by accurate Experiment, the Quantity of Water all these Kind of Plants, and other Pastures afford; it would be an Enquiry which would certainly furnish great Information, because it would determine the Choice of Plants, beyond the Determination of the Scale, or any other Method.—But unhappily, I have not an Elaboratory for the Pursuit of such Speculations, of which there are an infinite Number, of very great Moment to the Publick, worthy of the most careful and exact Examination. And at present, I have no Reason to think it prudent in me to engage in the Expence of Building and furnishing on Elaboratory.

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The Swine have had nothing all the Winter but Cabbages of different Kinds, and they have done very well with that Food; except such as were not bred to it, those do not keep themselves in so good Order with it as the others. I am aware that it will be a Matter of some Admiration to many, that I keep such a Quantity of Swine, as I have frequently had Occasion to mention in this Report.—My Reasons are principally, that of making great Quantities of Dung, to which this animal wonderfully contributes, and the obtaining large Quantities of Meat at a cheap Rate, for a very large Family as mine is.—As to the Object of Dung, my Swine have made much, but I think I could dispose them so, as to make three Times the Quantity they have done; but I have not Room for that Affair in this Report.

I before, when describing the Uses I made of the Cabbages from Winter Plants, in our first Set of Experiments, spoke of the Horses eating the Cabbages.—The same Horse has been chiefly employed all the Winter in drawing Home this Provender, though occasionally, all the working Horses have been used, and without Distinction, they all eat the Boorcole most eagerly. But what is more remarkable, the Horse which has been chiefly employed in this Business, is in better Order than any other draft Horse I have; and I find (from the Nature of his Employment, often requiring him in the Cabbage-field, when the Horses got their Corn) he has been deprived of his Share of Corn.

These Events have determined me to try an Horse next Winter with the Boorcole, and Hay, and another with the Boorcole and Corn. It may be imagined that the Boorcole will grip the Horses: I cannot tell, but the Plant, as I before said, is very dry and warm. Should it be found to answer the Purpose of maintaining the Farmer's Horses, with a small Allowance of Hay or Corn, or even both, it will be inestimable indeed.

I should enlarge much more upon many of the Subjects I have touched upon, but this Report is already gone to too great a Length; and I have other Matters to offer, and therefore I must conclude upon this Subject of the Cabbage Husbandry, and its Uses.

Some small Experiments upon Rape, as a Winter Pasture.

Still having in View this most important of all other Subjects, the maintaining a great Number of Cattle at a cheap Rate, chiefly for the Purpose of making Manure, that the Cattle may (as I have once said upon another Occasion) *maintain the Farm*, instead of the common Idea of the Farm maintaining the Cattle; I introduced in the past Summer, some small Experiments intended chiefly for my own Information, upon *Rape*; and my most sanguine Expectations having been so much exceeded in the Event, that I should consider myself unpardonable, were I to defer giving the Publick some Account thereof.

Some Time about the Middle of July last, I sowed with my own Hands, a little Patch of Ground in my Garden with Rape, as I imagined very thin; and indeed it came up so thin, and appeared so insignificant, that for some Time, I held it in great Contempt. However, at Length, I observed it began to shoot forward, and to cover the Ground, I thought too much. The lovely appearance it began to make, induced me to transplant a few Rows of it, also in my Garden; and from the present Appearance of Success, the latter End of *August*, I sowed four Rows in my Cabbage Field, with the Drill Plough, a single Row on each five Feet Ridge. When the Rape in these Rows came up sufficiently strong, I had the Rows thinned by Hand, and intended to leave the Plants twelve, eighteen Inches, and two Feet asunder in the Rows, but it is hard to get such Business done properly, if every Stage of it is not attended.

Thus, my three little Experiments went on, and indeed the Appearance of the Rape in every one of them astonished me and many who saw it, in *October*, *November* and *December*; and so on through the Winter, during which I do think, Vegetation scarcely ever ceased.

When the Frosts came, and that I walked out in a Morning to look at my several Plantations, the Leaves

of the Rape, as did those of all my other Vegetables, declined; but as soon as the Day advanced, so that the Frost disappeared, the Plants were again erect.

I was careful not to touch my Rape all the Winter, save a few Plants I cut myself, on the 26th of *October*, to see whether the Stumps would shoot again, which they did, but not worth Attention.

I have imagined all along, that the broad-cast Method will answer as well or better for this Plant, than the drilled; how it will turn out, we are now to examine; but at any Rate, the great Appearance it makes in the broad-cast Way, renders it an Object truly worthy the common Farmers Attention, because all the common Operations of their Husbandry will do the Business, if they will manure for it, or even after Potatoes, give the Ground to it.

I do not mean to enlarge in this Report upon the very many Advantages which it appears to me, this Plant promises to be productive of; I shall therefore proceed to examine our Produce from the several Experiments; with only observing, that on the 19th Day of *April*, I sent two Plants of Rape to the DUBLIN SOCIETY, which weighed eighteen Pounds, Roots and all: We shall find some presently that weighed more without the Roots.

What remained of the Ground under the broad-cast Rape, contained 192 Feet. This Produce was cut on the 30th of *April*, and weighed 2 C. 21 lb.—192 being our Divisor of 70560, (the Number of Feet in an Acre) our Answer will be 367; with this Number, we are to multiply our Produce of 2 Ct. 21 lb. and our Answer will be 40 Tons, 2 Ct. 3 qr. 7 lb. The Number of Plants 219. The Average 1 lb. 1 oz. and near $\frac{1}{2}$. The Produce was given to the Cattle, and they eat it very eagerly. The Stalks which they left, I weighed, they amounted to 32 lb. This Waste being multiplied by 367, amounts, upon an Acre of equal Quality, to 5 Tons 4 Ct. 3 qr. 12 lb. which we are to deduct from our gross Produce as Waste: though I think the Man who pays Attention to the collecting Manure, will not consider it as all Waste.

				T. C. Q. lb.
Gross Produce of an Acre broad-cast, -				40 2 3 7
Deduct for Waste, - - -				5 4 3 12
Net Produce of Food, - - -				34 17 3 23

This thirty-four Tons, and upwards, I consider as a prodigious Thing, to be obtained in a Manner without any Trouble; and although I sowed this little Patch in my Garden, I would not have the Reader imagine, that my Garden is like many others, for I hate the Trouble and Expence of a Garden, because I look upon it as the greatest Enemy to a Farm. Some of my Fields are now in much better Health than my Garden; and in my Mind, those are the Gardens which are to enrich a Nation.

I shall now examine the Produce of the transplanted Rape.

N ^o .	Plants.	Distances.	Produce.		Average.	Extraordinary	
			Ct. qr. lb.	lb. oz.		Plants.	lb. oz.
1	6	2 ft. by 4	0 1 4	5 5 $\frac{1}{2}$	-	-	-
2	6	18 In. by 4 ft.	0 1 8	6 0	9	3	
3	6	12 In. by 4 ft.	0 0 24	4 0			

Let us examine these Productions, with Respect to the Acre.

N^o. 1. Each Plant occupied 8 Feet. In that Proportion, our Number upon an Acre would be 8820, which being multiplied by our Average of 5 lb. 5¹ Ounces amounts to 20 Tons 19 Ct. 2 qr. 10 lb. 1 oz.

N^o. 2. Each Plant occupying six Feet, in that Proportion, our Number upon an Acre would be 11,760. which being multiplied by our Average of 6 Pounds, amounts to 31 Tons 10 Ct. I cannot but think there is something very Particular in this Average being so much more than the former.

N^o. 3. Each Plant occupying 4 Feet, in that Proportion, our Number upon an Acre would be 17,640, which being multiplied by our Average of 4 Pounds, amounts to 31 Tons 10 Ct.

From these, we are now to make some Deduction for the Stalks which the Cattle left. They weighed 5 Pounds. I have them not distinctly and therefore must calculate the Gross.

Our three Experiments, occupied 168 Feet, which being the Divisor of 70,560, our Answer will be 653, with a small Remainder, a Fraction which I shall take no Notice of; 653 must be multiplied by our Waste of 5 Pounds, and our Answer will be 29 Ct. 17 lb. which is our gross Waste.—This I shall divide by 3, in Order to deduct from each Produce before ascertained, their exact Proportion of Waste, *i. e.* 9 Ct. 1 qr. 24 lb. 5 oz.

		T. C.	qr.	lb.	oz.
N ^o . 1.	2 Feet by 4.—Gross Produce	20	19	2	10 1
	Deduct for Waste - - -	00	9	1	24 5
	Net Produce of Food - -	20	10	0	13 12
N ^o . 2.	18 In. by 4 feet, Gross Produce	31	10	0	0 0
	Deduct for Waste - - -	00	9	1	24 5
	Net Produce of Food - -	31	0	2	3 11
N ^o . 3.	12 In. by 4 feet, Gross Produce	31	10	0	0 0
	Deduct for Waste - - -	00	9	1	24 5
	Net Produce of Food - -	31	0	2	3 11

I now come to state the Produce of the Field Rape, sown in Drills, as already mentioned; one Row on five Feet Ridges, for which Purpose, I attended on the *first* of May the cutting 68 Feet of each Ridge, and the weighing the Produce of each distinctly. I intended to cut an whole Row of each, which were 672 Feet long, but my good Neighbours had carried off several Perches in Length, for the Benefit of their Stock. An hard Case.

N^o. Ridge. Distances. Plants. Produce. Average. Extraordinary

			C. qr. lb.	lb. oz.	Plants. lb. oz.
1. 68 ft. by 5. 16 $\frac{1}{4}$ In.	50	2 0 4	4 0	9 2	
2. 68 ft. by 5. 18 In.	46	2 0 8	5 0	9 6	
3. 68 ft. by 5. 14 $\frac{1}{2}$ In.	56	2 0 10	4 3		
4. 68 ft. by 5. 20 $\frac{1}{4}$ In.	40	1 2 4	4 3		

The Produce from these four Ridges was given to the Cattle, and they eat it eagerly. The Stalks they left were weighed, and amounted upon the Whole to only 14 Pounds 6 Ounces.—Which upon an Acre in the same Proportion, would amount to about 6 Ct. 2 qr. 20 lb. as I had not the Waste separate, I must proportion this to each, which will be 1 Ct. 2 qr. 19 lb. to be deducted from their acreable Amount.

Let us now state the acreable Produce of each.

	T. Ct. qr. lb. oz.
N ^o . 1. The acreable Produce in Gross	20 15 3 1 14
Deduct for Waste	- - - 00 1 2 19 00
Net Produce of Food	20 14 0 10 14

N ^o . 2. The acreable Produce in Gross	21 9 3 13
Deduct for Waste	- - - 00 1 2 19
Net Produce of Food	21 8 0 22

N ^o . 3. The acreable Produce in Gross	21 13 2 7
Deduct for Waste	- - - 00 1 2 19
Net Produce of Food	21 12 0 16

N ^o . 4. The acreable Produce in Gross	15 18 2 22
Deduct for Waste	- - - 1 2 19
Net Produce of Food	15 17 0 3

Recapitulation.

* These Averages are not calculated to the utmost Exactness, $\frac{1}{4}$ of an Ounce is of no Moment here.

RECAPITULATION.

CULTURE.

	Distances.	Gross Weight. T. C. qr. lb. oz.	Waste. T. C. qr. lb. oz.	Net Produce. T. C. qr. lb. oz.
Broad Cast.	- - - - -	40 02 3 7 00	5 4 3 12 00	34 17 3 23 00
Transplanted.	- - - - -	20 19 2 10 1	0 9 1 24 05	20 10 0 13 12
Ditto.	- - - - -	31 10 0 00 00	0 9 1 24 05	31 00 2 3 11
Ditto.	- - - - -	31 10 0 00 00	0 9 1 24 05	31 00 2 3 11
Drilled.	- - - - -	20 15 3 1 14	0 1 2 19 00	20 14 0 10 14
Ditto.	- - - - -	21 9 3 13 00	0 1 2 19 00	21 08 0 22 00
Ditto.	- - - - -	21 13 2 7 00	0 1 2 19 00	21 12 0 16 00
Ditto.	- - - - -	15 18 2 22 00	0 1 2 19 00	15 17 0 3 00
				<hr/>
				197 00 2 12 00

Here

Here we see upon these eight different Methods of Cultivation, we have in the Proportion of 197 Tons of excellent Food for Cattle upon eight Acres of Ground, when Food is more difficult to be had, than at any other Season of the Year. The Reader will find the Average produce above 24 Tons an Acre. If he considers when this was ascertained, he will then consider the Value of it.

As I before said, I do not mean to enlarge upon this Subject, I shall only make a very few pertinent Observations.

We perceive the broad Cast Method, has afforded the greatest Produce both Gross and Net, of any other Method here related. That I consider a particular Happiness to the common Farmer, for many Reasons, which I shall not now mention. The Land is left clean, with many Roots and Stumps, which I think will shew an important Use in a large Culture of this Kind.

The transplanted Rape we see comes next in Quantity, is also very great in Point of Produce, and we see the Plants are vastly more succulent than the broad Cast, having much less Waste.

The drilled, in Rows five Feet asunder we see has produced a good Quantity, but I think it is pretty manifest our Rows were too far asunder. I shall try them at different Distances. This we see, had considerably less Waste than even the transplanted, perhaps because it was sown later.

The broad Cast blossomed first, the drilled next, and the transplanted last.

I shall now stop upon this Plant; from what I have already seen, I could almost write a Volume upon it; but I shall wait the ensuing Year, when I hope to speak upon it from larger Experience, and therefore, I shall only say, that I hope this Report of Experiments on Winter Pastures, will shew what I long ago suggested, that if we would make use of them, Providence has most kindly furnished us with a great Variety of Plants, fit for

for Winter Pastures, very luxuriant and bountiful in their Nature; without beating about the Bush, after Burnet, and a Number of other insignificant Trifles, which have busied the World for some Time, at no trifling Expence.

I shall close this Report, with an Apology to the Publick, for not fulfilling a Promise I made in my Report for the Year 1768, of furnishing a Plan for a new constructed Granary. I hope, as this Report is run to a Length which has not been usual with me, that I shall be indulged to postpone the Granary, for another Year. In the mean Time, if any Gentlemen shall wish to be made acquainted with my Notions of that Matter, I shall have Pleasure in giving them every Information in my Power.

T H E E N D.

T H E I N D E X.

A.

A Rable Land, how converted to Pasture, to afford
immediate Profit, Page 33

C.

<i>Cabbage,</i>	The Turnip-rooted, how and by whom obtained—Introduction,	6
<i>Cabbages,</i>	The Author's Distinction between Summer and Winter Plants,	54
	Nine Kinds, Experiments on the Winter Plants	54
	Average Weight,	62
	Acreable Produce, Table of,	67
	Duration, Table of,	73
	Uses converted to	73
<i>Cabbages,</i>	Ten Kinds, Summer Plants,	76
	Average Weight.	87
	Acreable Produce, Table of,	90
	Duration, Table of,	99
	Observations, general on ten Kinds, as to their Culture, Use, &c.	101
	Successions, Table of,	110
	Distances, Table of, for Planting,	114
	How used,	117
<i>Cattle Horned,</i>	Danger in their eating Clover, <i>Note,</i>	11, 16
<i>Clover,</i>	Danger of to horned Cattle, how prevented, and how cured,	16

I

Clover,

I N D E X.

<i>Clover,</i>	Mowing it, better for the Ground than grazing it,	14, 26
<i>Clover,</i>	Preparation for Wheat,	29
<i>Clover,</i>	How most profitably used for all Kinds of Cattle (Sheep excepted)	11
<i>Corn,</i>	Prepared for by Winter Pastures, Introduction,	1
<i>Compost,</i>	A profitable Method of making,	34

E.

<i>Experiments,</i>	Use of, Introduction,	7
	Experiments upon what, in 1769, Introduction,	9

G.

<i>Granary,</i>	A new constructed One, Author's Apology for not introducing this Year,	128
-----------------	--	-----

H.

<i>Huntsmen,</i>	Their Nufances, and to guard against,	34, 38
------------------	---------------------------------------	--------

P.

<i>Ploughing,</i>	How to ease the Cattle in coming out,	37
<i>Potatoes,</i>	Produce of two Kinds,	37

S.

<i>Swine,</i>	Maintained on mowed Clover,	12
	On Cabbages,	73, 117
<i>Stones,</i>	Picked off Land, Objection,	
	Answered—Note	16

T.

<i>Turnips,</i>	Comparative Experiments on,	42
<i>Thieves,</i>	Petty, to which the Farmer is liable, Remedy wanting,	115

R.

<i>Rape,</i>	Experiments on, as a Winter Pasture,	121
--------------	--------------------------------------	-----

W.

<i>Wheat,</i>	Sown on Clover-lay after one plowing,	29
---------------	---------------------------------------	----

EXPERIMENTS IN AGRICULTURE,

Made under the DIRECTION of

The RIGHT HONOURABLE and HONOURABLE
DUBLIN SOCIETY,
In the Year 1770.

In which the CABBAGE HUSBANDRY is further
pursued ; the Culture of RAPE in various Methods
as Food for Cattle ; the Culture of CLOVER, and
its prodigious Value to the Farmer, exemplified by
Experiments ; the Culture of WHEAT by different
Methods, and other Interesting Subjects.

B Y
JOHN WYNN BAKER, F.R.S.
And EXPERIMENTER in AGRICULTURE to the
DUBLIN SOCIETY.

Lv. 63
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and the PRINTER hereof, in *Dame-street*.

M DCC LXXI.

TE

TO THE
RIGHT HONOURABLE and HONOURABLE
DUBLIN SOCIETY.

My Lords and GENTLEMEN!

I HAVE had the honour to dedicate to Your protection, a register of some of my experimental enquiries in Agriculture for some years past, with several other papers, upon the subject of rural oeconomy; and Your kind acceptance thereof, encourages me to beg Your protection of the following sheets.

The manner in which my experiments have been carried on, and the form in which they have been laid before the publick, I presume not to form any judgment of:—The continuation of Your countenance and protection, is the *test* of your approbation; and the publick imitation of my pursuits, bespeak their utility.—Considerations, which, on the one hand, fill my mind with *gratitude*, on the other with *pleasure*.

Your long experience of my endeavours, in the cause of Agriculture, has induced you, with a most honourable consent of voices, to place these pursuits, in a conspicuous light, and to establish them upon a firm basis.

At the same time, that I thank You with all my heart, for a confidence, which reflects so much honour upon me; allow me to assure You, that Your protection shall never be disgraced, by any failure in application at least, to promote Your views to the utmost of my power.

I confess, that for some time past, I have carried on these undertakings with timid caution;—the constant

attendant on uncertainty!—These sheets which I now lay before You, relate to matters depending, during suspense; but in the perusal, You will find an indication of ~~change in my experimental enquiries~~ ^{The expense} and produce of fields stated; and in one instance, *surprisingly* supporting improvements, which are convenient, substantial, and elegant.

At the same time, that experimental enquiries in Agriculture, afford amusement and delight; allow me to assure You, that a man had not need pursue, a more expensive entertainment, nor to have any other avocations of pleasure, to break in upon the application which they require; and therefore, he will be best suited for such a pursuit, whose mind has been satisfied, or rather satiated with the gaudy trappings of the world, which allure half mankind; how far this may be my case, I shall avoid to describe in any other manner, than just to say, that I *think*, I have *seen* the world; under that circumstance, perhaps I have adopted the occupation which every man wishes for more or less, sooner than the generality of active spirits; but it seems to be, so much the propensity of mankind, whether *Statesman* or *Senator*, *Soldier* or *Sailor*, *Tradesman* or *Mechanic*, that after running all the rounds of different callings, and different pleasures, *All ends in*, the AMBITIOUS view, of being a FARMER.

In this ultimate object of mankind, my case happens to be particular, because I am, under Your protection, open to the *scrutiny*, *application*, and *correspondence* of the multitude, under the acceptance of *EXPERIMENTAL Farmer*.—I can only say, that I will endeavour to *do my duty*.

Small experiments are always most accurate, because they are most under command; and carry with them information, and full conviction, to men of knowledge and science, so as, sufficiently to direct their imitation thereof, in the field at large.—But I have been so long, in experimental farming, and am so well acquainted with the contempt, with which the lower tenantry look on small experiments, and gentlemen farmers,

DEDICATION.

179

farmers, that I am convinced, nothing less than fields at large, will prevail upon them to imitate any improvement, which may be recommended to their attention.

To this end, I propose by degrees, to bring most of the fields constituting my farms, under experiments, and so introduce them into my future reports, with an account of the expence and produce, and the change of all the improvements which I shall make in each field, stating the whole, whether loss or gain.

And in this pursuit, I propose to adhere as closely as possible to the idea, which I have so strongly urged in my *Practical Agriculture Epitomiz'd*, of at least lessening the use of fallows, (which I am of opinion is practicable) and of introducing courses of crops, by alternately changing the ameliorating and impoverishing ones, in a manner, similar to what is there set forth.

And in order, to render the nature, and state of the farm as clear, and intelligible as possible to my readers, I intend to have a new survey of the whole, with the ~~size and in reports of each~~ field, in the acres of every kind, which are in use in this kingdom.—The map I propose to have engraved, and shall every year, furnish my reports with the same, referring the reader to the map for the field he may be reading, of which, a small beginning is made in this report, where I have referred to the fields, by their numbers, in my present map.

Besides this, I intend to devote one field, to variety of small experiments, which I mean to conduct with the most minute exactness in every particular, and also, variety of manures, not only of *quality* but of *quantity*; different successions of crops, as well as various methods of culture; and as these shall answer, I intend to carry them into the fields at large, for the fuller information and conviction of the publick.

By

vi **DEDICATION.**

By this double pursuit, I flatter myself, that Your object of instructing the farmer, will be answered in a very general manner.

And if I live to accomplish, all that I see before me in this view, I shall differ in my sentiments, with the general acceptance, of the *farmers* department being *bumble*—mine, I shall consider glorious, and the more so, from being under Your protection.

Considerations, which will ever animate me to approve myself, upon all occasions,

I am, My Lords and Gentlemen,

Your truly faithful,
and most obedient

humble servant,

JOHN WYNN BAKER.

LAUGHLINSTOWN,
July 25th, 1771.

INTRODUCTION.

ON the first of February, 1770, the DUBLIN SOCIETY were pleased to call upon me to lay before them a Plan, upon which to found a system of Experiments in Agriculture.—Accordingly, I did soon after lay before the Society, two papers upon that subject, which they referred to the consideration of a select committee of gentlemen, most knowing in agriculture; chosen by the Society for that purpose.

This committee met from time to time, and after closing their resolutions, made their report on the 8th of March, 1770, to the following effect, and caused one of the papers referred to them, to be printed in the proceedings of the Society.

“ Lord Arran reported from the select committee appointed to take into consideration the two papers laid before the SOCIETY by Mr. Baker, the one entitled, *Hints for the Improvement of Agriculture by Experiments*; the other, *A Plan for various Sets of Experiments*; and to report to the SOCIETY, what course of experiments they judge it will be most useful to the agriculture of this kingdom to be pursued, for what number of years they would recommend such experiments to be carried on, and the quantity of land which they would think proper to be employed in the same; that the said committee had met, pursuant to order, and came to the following resolutions.”

“ RESOLVED,

“ 1st, That this committee do highly approve of the general system contained in Mr. Baker's paper, entitled, *Hints for the Improvement of Agriculture, by Experiments*, which is as follows.”

“ Hints

" HINTS for the Improvement of Agriculture, by Experiments, submitted to the consideration of the Dublin Society, in consequence of the sentiments which appeared amongst Gentlemen at a meeting of the Society on the first of February, 1770."

" The vulgar and common practised methods of agriculture, are mistakenly calculated for a little immediate gain, without regarding future emolument, and therefore tend to the too general impoverishment of land."

" The reverse of this practice, I conceive to be the object of the DUBLIN SOCIETY."

" To harmonize live stock, and tillage in such a manner as to increase one, and improve the other, I apprehend will most effectually accomplish their laudable purpose."

" It therefore follows, that the man who shall maintain the most live stock, and produce the greatest quantity of corn, upon any given quantity of ground (regard always being had to the nature of the land when he enters upon it) will indisputably be the most useful member of the community, or in other words, will be the most judicious occupier of land."

" For these reasons :

" That the more live stock he maintains with a small quantity of ground, the more manure he will accumulate."

" It therefore follows, that more corn will be produced than can be by the common practice of devoting farms wholly to tillage, or wholly to grazing, and that the improvement, instead of the impoverishment of the land, will progressively increase, provided his manure is judiciously disposed of."

" For,

“ For, contrary to the received and established maxim, that the land is to maintain the live stock, I conceive, that the stock is to maintain the land; from this undeniable and experienced consequence, that where *all* is taken away, and that *nothing* is returned, poverty must ensue.”

“ Hence it is, that we have so many worn-out farms.”

“ These maxims then, lead to this first and fundamental principle, that the business of the farmer, is first to provide *ways and means*, upon the *cheapest* terms, for not only *profitably* maintaining, but *wholly increasing* his live stock, which we see from the preceding rules (abstracted from the profit the animals afford in their natural produce by dairy, wool, labour, and sale of themselves) *are in general*, to be the source from whence *improvement, health, and luxuriance* is to appear in *corn* upon the surface of the farm.”

“ And most happily for mankind, it appears, that nature has not only furnished a great variety of pastures, amazingly plentiful (not hitherto much in use) which will not only maintain a considerable live stock at a cheap rate, but most excellently prepare land (much beyond the common preparations) for the reception of corn.”

“ It hence follows to examine what the plants are, which will afford these manyfold advantages.”

“ They appear to most advantage under the following heads, some for Summer use, some for Winter, and some for both.”

INTRODUCTION.

Number of kinds

N ^o .	1.	The Cabbage.	25.	} Some for Summer and some for Winter use.
	2.	The Turnip.	9.	
	3.	The Rape.	4.	Chiefly for Winter use.
	4.	Carrots.	5.	For Sum. and Wr. use.
	5.	The Parsnip.	3.	For Winter use.
	6.	Lucern.	4.	Ditto.
	7.	The Trefoils.	25.	} For Summer use green, for Winter use in hay.
	8.	Sainfoin.	3.	
	9.	Common grasses.	36.	
	10.	The Vetch.	31.	} With many seminal va- riations.
	11.	Lentils.	3.	
	12.	The Pea.	16 at least.	The grain & straw.
	13.	The Horse Bean.	4 at least.	Ditto.
	14.	The white Corn.	5.	} The straw for Winter fodder and litter."

"Of these plants N^o. 1. 2. 3. 6. 7. 9. 11 and 13. are the most valuable, to obtain profit and solid improvement at the cheapest rate.—And of these, I have much reason to believe N^o. 1. 2. 3. 7. 10 and 13. to be preferable to all the rest, because they are abundantly prolifick, and are to be obtained in plenty by easier means than some of the others; and N^o. 1. 2. 3. 7. 10 and 13. afford the best preparations of land for the reception of white corn."

"Thus we have before us a great variety of plants, which will afford the advantages sought for, if the most ameliorating, as well as the most prolifick of them are chosen, and the most judicious methods of cultivation ascertained."

"How to make these discoveries can only be come at by a series of repeated experiments."

"To prevail upon the farmer to adopt their use, and the best culture of them, will be best effected by exhibiting to his view and inspection large plantations of such as experiments shall prove to be most profitable. Because

INTRODUCTION. xi

Because, when the exhibition shall be large, the too common idea of impracticability vanishes, and the practice is thereby rendered more familiar.—And the crops of corn which will follow these without the expence of fallow, I expect will be truly inviting to him, upon his own and only principles of looking for profit.”

“ The use of these plants for feeding cattle, leads into another set of consequential experiments, to ascertain how much more they can or will eat of one plant than of another, and thereby will determine which are to be preferred, always retaining in view the important object of preparing the land for corn.”

“ From these heads, gentlemen are apprised of my ideas as to the pursuits of an experimental farmer for the publick information.—And from these heads, I submit to the consideration of the Society, what mode of experiments they would please to have pursued, as some gentlemen, perhaps, may think of modes of conducting experiments, which do not occur to me.”

“ Enquiries upon speculative and philosophical principles, are collateral pursuits, which will often afford discoveries, but principally tend to unfold the *causes of certain effects*. A species of enquiry which I should be fond of, and shall either pursue it or not, as the Society shall think most proper.”

February 1770.

JOHN WYNN BAKER.

“ RESOLVED,”

“ 2d, That it is the opinion of this committee, that instructions be given to Mr. *Baker* to proceed in making the following experiments in agriculture, viz.

I.

“ In the culture of rape as food for cattle, and as preparative to land for the reception of seed corn.”

“ 1st,

" 1st, Three acres to be sown with rape this present month of *March*, for feeding cattle in Summer, and to be succeeded by wheat sown in *September* or *October* next."

" 2d, Four acres to be sown with rape in *August* next, for early Spring food for cattle, to be succeeded by oats or barley to be sown with clover the same Spring."

" 3d, Four acres of wheat stubble to be sown with rape in *September* or *October* next, for spring food for cattle, to be succeeded by turnips or cabbages in summer." *

II.

" In the culture of Sainfoin."

" One acre to be sown in the common husbandry with sainfoin, one half without corn, and the other half with ten stone of oats."

III.

" One rood to be sown this Spring with turnip in drills."

IV.

" In the culture of Cabbages."

" Two acres to be planted this Spring with different kinds of cabbages, to discover their comparative value."

* I have here omitted a part of this third instruction, which I conceive must have been a mistake.—I purposely avoid giving the reasons here, but shall have pleasure in giving them to the Society, if they think it necessary.

" In

V.

" In the culture of wheat."

" Six acres of clover-lay to be sown with wheat in September or October next,

" RESOLVED,"

" 3d, That it is the opinion of this committee, that Mr. Baker do continue to pursue the following experiments now depending at his farm, according to an order of the 20th of April last, whereby instruction was given to him to extend his experiments in regard to the maintenance of cattle both in Summer and Winter seasons."

" 1st, Sixteen acres of clover for the Summer maintenance of cattle."

" 2d, One acre of cabbages for Autumn."

" 3d, Five acres of cabbages of various kinds for Winter use."

" 4th, Four acres of turnips of various kinds for winter use."

And at my particular request, this committee passed the following resolution.

" RESOLVED,"

" 4th, That it is the opinion of this committee, that the committee for agriculture, do from time to time view the above experiments in their progress, and report to the Society the manner in which they may appear to them to be executed."

I can only regret, that gentlemen who are of the society, and consequently of this committee, cannot make it convenient to themselves to visit the experiments more frequently as a committee: I am always glad,

xiv INTRODUCTION.

glad to see them in small parties, in the excursions which most of the members make at different periods, to look at the progress of my pursuits; but I submit to gentlemen, whether it is not for the honour of the Society, and the security of the publick, that they should, at least three or four times in a season, appear here in the capacity of their committee for Agriculture, with their chairman of that committee, to inspect into the state and progress of the undertakings I am engaged in: for without the chairman, I conceive, be the number ever so large, they cannot be a committee. — I have often solicited this; and so convinced is the Society of the propriety of such inspection, that a resolution to the same effect of the one just now recited, has always been passed when I have requested it. — I now venture to take this public method of soliciting the visits of the committee, as being the last effort which I can make to prevail upon them.

“Then, the question being severally put upon each of the resolutions, the Society agreed with their committee in the same.”

The informations which the Society and the publick are to receive in this report, correspond as nearly as contingencies and unforeseen events would admit of, with the preceding resolutions and instructions, and are as follow.

Before the committee on Agriculture, the following resolutions were presented and agreed to:

“Resolved, That the committee on Agriculture, do report to the Society, the progress of the undertakings, and the state of the publick, in relation to the same, at the next meeting of the Society, and at such other times as may be thought proper by the committee.”

ARTICLES
The following are the articles of the constitution of the Society, as amended by the annual meeting of the Society, held on the 1st of January, 1800.

ARTICLES UNDER EXPERIMENT,

In the YEAR 1769.

- Nº. 1. Rape sown in Spring, for feeding cattle in Summer, to be succeeded by wheat.
2. Rape sown in August, for the Spring food of cattle, to be succeeded by cabbages.
3. Rape sown on wheat stubbles in Autumn, for Spring food of cattle, to be succeeded by Spring corn.
4. Sainfoin, sown with and without Spring-corn.
5. Cabbages, viz.

Anjou Colewort.	}	All Winter Plants.
Scotch Cabbage.		
Flatt Dutch Cabbage.		
Red Cabbage.		
Flatt Dutch Cabbage.	}	All Spring Plants.
Green Savoy Cabbage.		
Large Scotch Cabbage.		
Turnip Cabbage.		
Long-sided Cabbage.		
Turnip Rooted Cabbage.		
Beorcole.		
Brocoli.		
6. Summer use of Broad-red Clover, in the maintenance of cattle.
7. Wheat in drills, preparative to the same grain in broad-cast.
8. Wheat on Clover-lay.
9. Apple Potatoes.

E X P E-

EXPERIMENTS I N AGRICULTURE.

GENERAL EXPERIMENTS on RAPE, as FOOD for CATTLE.

EXPERIMENT the FIRST.

Rape sown broad-cast in Spring, with an intention of having it as a mowing-pasture for cattle in August and September, and to be succeeded by wheat.

THE land chosen for this purpose, this year, is a shallow soil, of a strong adhesive nature when wet, and when perfectly dry, in lumps, almost impregnable, but between wet and dry, reducible.—It lies upon a bed of lime-stone quarry, and has a natural declivity to the north-west.—Naturally very poor, and I believe never received any manure until I dressed it.

In the year 1768, I planted three acres of it under potatoes, in the ordinary method of the country, in
B seven

seven feet beds, and *four* feet trenches.—In 1769, I had it under different kinds of drilled turnips, as appears in my Report for that year.

The frost, snow, hail and rain which we had this year in the months of March and April, rendered it impossible to get the ground in any tolerable condition for the reception of the rape seed, before the 28th day of April.—On that day, twenty broad sets were sown, with twelve ounces of rape seed to each set or ridge.

I intended to have sown it earlier, but the event will shew, that as it was, I sowed it too early, at least upon *this* ground.

The rape was slow in coming up, partly owing to be sure to the coldness of the weather, and did not grow in that luxuriant spreading manner which I expected.—It made but a poor figure until July, then it looked pretty sappy, and tolerably vigorous.

A great quantity of charlock appeared in it, all which I had pulled up by the roots on the 16th and 17th of July, which cost me 9 s. 1 d. by the employment of nineteen children, and a man to attend them.

After this weeding, I began to retain better expectations from the rape, as it shot forward, and I began to hope, would afford a plentiful mowing crop for the purpose of foddering the cattle.

But instead of that, it soon began to run up very fast, shortly broke out into branches, with few and small leaves, like rape in blossom from autumn sowing, but with strong branches and few leaves; and in a short time after, began to grow hard and pipey, and the seed to form.

In September, I began to mow it for the cattle, and they eat it with great eagerness; but every day it became worse, by growing harder, inasmuch, that
before

before it was exhausted, there was very great waste, as to the object of fodder, but it wonderfully raised the dunghil, which in my mind is of the first moment to the farmer; for if he has manure in plenty, and disposes of it judiciously, there is hardly any thing he need to fear except climate.

It was pretty far in October, before all this rape was cut, (and the seed coming forward very fast) although it was brought home in great profusion.

It was so strong, that the mowing of it could not be accomplished with a common scythe, it would have broken an hundred; but I have by me, a short strong scythe, with a thick back, intended to mow bushes and other rubbish.—with this instrument I got it mowed, but not so close to the ground as I wished, it being next to impossible to mow such strong plants as these were, close to the ground; and I became the less solicitous about it, as from the strength of the rape stumps and roots, and the weeds which were upon the ground, owing to the rape shooting up in tall stems, instead of broad luxuriant leaves, which I looked for, I gave up my intention of sowing the ground with wheat, as was originally intended, and therefore I ploughed it up, and let it lie the winter, for the reception of spring corn.—Accordingly, I ploughed it again in spring, and sowed it with oats on the 27th, 28th and 29th of February 1771,—and in May following, with clover seed.

If this rape had branched out in broad luxuriant leaves, as the plant is inclined to do, from autumn sowing, there can be no doubt but it would have afforded a fine preparation of the land for wheat, because the shelter of the rape, and its attraction of dews and rain, would certainly have checked all weeds; but its running so soon, gave them room to rise, so as to render the ground unfit for the reception of wheat, to which the harsh and coarse stubbornness of the rape stumps and roots contribute.—Hence I conclude, that the rape was sown by much too early.

If by repeating this experiment, a season can be ascertained for sowing it in spring, so as to have it in luxuriance as a mowing pasture for cattle, in *August* and *September*, and to completely cover the ground, I think that in this case, it would promise to be an excellent preparation for wheat; but if it shall be found, upon repeated trials, that the spring, or early summer sowing of rape, will always cause it to run, in that case it cannot answer, either the purpose for cattle, or preparation for wheat, sown at either of *those* seasons.

However, I shall as soon as possible, repeat the experiment, at different periods in the same summer, in order to discover, how far nature will admit us to go, as to the object of preparing land for the reception of wheat with this plant, instead of fallow.

As this experiment seems to have sufficiently informed us that *April* is an improper time to sow rape for the purposes in view, I shall not trouble the reader with the produce in weight—The oats, which have succeeded this rape, will have a place in my Report for the year 1771.

EXPERIMENT the SECOND.

Rape Transplanted from the above Sowing.

As the surest test, to ascertain whether I had sown the preceding rapes at the proper time, I determined to transplant some of it; accordingly, on the 16th of July, I transplanted the following rows; viz.

- N^o. 1.—A ridge 4 feet wide, 32 perch long—plants
12 inches asunder.
N^o. 2. Do. — — — Do. — — Do.
N^o. 3. Do. — — — Do. — — plants 18 inches.
N^o. 4. Do. — — — Do. — — Do.

These

These plants, all of them, flourished much better than the former, and were at least four times the size of any of those left in the ground where they were sown. Nevertheless, these also run; but the cold nights coming on, prevented their forming their seed like the formers: they were vastly more sappy, and much better food for cattle.

These circumstances confirm I think, beyond contradiction, that for the two objects in view, this rape was sown too early.

The produce in weight, I shall not trouble the reader with, as I think these events will sufficiently dissuade him, not to embark, in this part of our pursuit, until, from further experience, we can furnish him with information, as to a more proper time for sowing the rape, the better to accomplish the two points in view,—or rather three, viz. That of producing pasture for cattle, instead of working fallow, and thereby, preparing the land for wheat.—Objects, of the first moment to the farmer and the community.

EXPERIMENT the THIRD.

Rape Drilled.

N^o. 1. Six ridges, 4 feet wide, and 32 perch long, drilled with single rows of rape.

N^o. 2. Six ridges, the same length and breadth, drilled with double rows of rape 10 inches asunder.

N. B. The double and single rows were drilled alternately on the same ground, on the 18th day of July.

N^o. 3. Six ridges, 4 feet wide, and 32 perches long, drilled with single rows of rape.

N^o. 4. Six ridges, the same length and breadth, drilled with double rows of rape 10 inches asunder.

N. B. These were sown in alternate rows on the same ground, on the 24th day of July.

22 General Experiments on Rape, &c.

The several rows were thinned the latter end of August, and twice horse-hoed during the summer.

On the 3^d of April 1771, I had a row of each of these cut and weighed, and the produce was as follows.

		T. C. Q. lb.				
N ^o . 1.	Single row, produced	1	2	1	11	} Sown July 18th.
— 2.	Double row, Do.	1	4	3	13	
— 3.	Single row, Do.	1	5	2	22	} Sown July 24th.
— 4.	Double row, Do.	1	6	3	25	

Thus we have before us, the produce of a ridge of each kind. I shall compare the acreable produce, by first examining our quantity of ground in each ridge, in order to ascertain how many ridges will be required to make an acre.

The ridges we have seen were 32 perches in length, which being multiplied by 21, shews that our ridges were 672 feet long; and being 4 feet wide, we are to multiply the length by the breadth, and our answer will be 2688.

Thus we have the number of feet of ground in each ridge. This number then is to be the divisor of 70560, which are the number of feet in a plantation acre, and our answer will be 26, and 672 feet remainder. Thus we find, that 26 of our ridges, and 672 feet of ground, will make a plantation acre.

N^o. 1. We have seen that a ridge of the single rows in the first sowing, afforded 22 C. 1 Q. 11 lb. which being multiplied by 26, amounts to 29 T. 1 C. 6 Q. 6 lb. and our fraction of 672 feet, in the same proportion, to 5 C. 1 Q. 10 lb. both which being added together, makes our acreable produce, 29 T. 6 C. 1 Q. 16 lb.

N^o. 2. A ridge we have seen of the double row, from the *first* sowing, afforded 24 C. 3 Q. 13 lb. which
being

being multiplied by 26, amounts to 32 T. 6 C. 2 Q. 2 lb. and our fraction of 672 feet, in the same proportion, amounts to 6 C. 0 Q. 21 lb. which being added to the former, makes our acreable produce, 32 T. 12 C. 2 Q. 23 lb.

N^o. 3. We have seen that a single row, of the *second* sowing, afforded 25 C. 2 Q. 22 lb. which being multiplied by 26, amounts to 33 T. 8 C. 0 Q. 12 lb. and our fraction of 672 feet, amounts, in the same proportion, to 6 C. 1 Q. 14 lb. which being added together, makes our acreable produce 33 T. 14 C. 1 Q. 26 lb.

N^o. 4. We have seen that a ridge of the double, from the second sowing, afforded 26 C. 3 Q. 25 lb. which being multiplied by 26, amounts to 34 T. 11 C. 1 Q. 6 lb. and our fraction of 672 feet, amounts in the same proportion, to 6 C. 3 Q. 0 lb. which being added together, makes our acreable produce, 34 T. 18 C. 0 Q. 6 lb.

RECAPITULATION.

	T.	C.	Q.	lb.	
N ^o . 1. Single rows, per acre	29	6	1	16	} Sown the
— 2. Double rows, Do.	32	12	2	23	
— 3. Single rows, Do.	33	14	1	26	} Sown the
— 4. Double rows, Do.	34	18	0	6	

This table of recapitulation, furnishes two important pieces of information, which, though very uniform and satisfactory, we must not consider as quite conclusive; *viz.* The last sowing in *July*, we see, affords considerably greater produce, than the first, for the plainest reason, that the earlier we sow this seed, the sooner it runs, and consequently affords the less produce for our purpose of foddering cattle in the yards for making dung, and seems to account very strongly for the state of our first experiment.

The

The second piece of information is, that the double rows uniformly produce more than the single rows, and consequently indicate, that they are to be preferred, when rape shall be sown in drills for the purpose of foddering cattle in the manner aforesaid.

It may not be improper to inform the reader, that the ground upon which this drilled rape grew, was under cabbages the year before.

EXPERIMENT the FOURTH.

Rape in Broad-cast.

On the 24th of July, two acres of rape were sown broad-cast, ten pounds of seed to each acre.

The ground chosen for this purpose, although in the same field in which the former experiments were carried on, (for at present it contains 19 acres) seems to differ something from the soil already described. It is not so stiff by a good deal, has abundantly fewer loose stones in it, is very shallow, and poor, to an incapability of producing any thing to profit, without great assistance of manure.

In July, I manured it with the dung of my yard, consisting of that of horned cattle, horses and swine: the dressing was indeed very high; about two smart one-horse-cart loads to a perch. I having ever found, that one acre highly improved, is much more valuable, than five imperfectly handled, was the reason why I gave this poor piece so liberal a dressing.

This rape came on but slowly for a time, as I find to be the nature of the plant; but at length it shot forward, and flourished away; but in winter, it met with a fate which I was not aware of, nor did I expect. The wood pigeons lay upon it prodigiously, and did it great damage: some plants I observed in the frost, to appear as if they had been singed; whether that

was

was owing to the wounds given by the birds, and thereby giving the frost the greater power, or whether it was entirely owing to the severity of the frost, is not in my power to determine.

However, very early in the spring, this rape shot forward, and as the days lengthened, the visits of the pigeons were less frequent, until they totally left it.

From this rape breaking out into blossom sooner than I expected, I am inclined to believe that the 24th of *July* is too early to sow it, for our purpose of foddering cattle in the yard.

However, early in *April*, I began to mow this rape for the horned cattle, such as cows, plough bullock, young cattle, calves, and swine; they all eat it with the greatest eagerness, and were foddered with it every evening, until the 19th day of *May* inclusive, and wheat straw in a morning; save, four calves of the preceding year, and they were foddered twice a day with the rape, and had straw before them also, and throve upon it vastly better than the other cattle, for no other reason, I believe, than because they were allowed more than the others; in short, they were in such order, that I dare believe that the butchers would have been glad to have had them for killing.

I need not tell the farmer, how necessary it is to be frugal of provender, in an harsh dry spring, as the last was, when he is like to be hard run with 40 head of cattle, many of which I should actually have been obliged to sell at so improper a season, had I not been possessed of this two acres of rape.

There is yet another circumstance, which renders this a truly valuable fodder:—The milk of the cows increased prodigiously, and the milk and butter were as good, sweet, and well flavoured I think, in every particular, as ever I tasted in *June*. Even the cream for the tea appeared to be perfectly free from any foreign flavour. The cows got hay every day, in the same manner

ner as I have in former years mentioned them to have when feeding on cabbages.

The simplicity of the culture for rape, for this purpose of foddering cattle, I cannot but think a particular recommendation of it to the farmer, and the cheapness of the seed in purchase, or the ease with which he may raise it, are objects which cannot fail I think of being persuasive to him.—And all persons, who have annexed to their farms, any bog, or other waste ground, the improvement of which, that can be executed by burning, might surely raise such quantities of rape for the purpose of mowing pasture, as would enable them to keep almost any number of cattle, by which, they would not only be bringing in the waste land, but making that the foundation of improvement to their sound land, by the immense quantities of dung they might raise by this means from the waste land.—Here the advantage to the cultivator would be double.

On the first day of *May*, I had four perches of this rape measured out for weighing.—It was mowed, immediately drawn home and weighed.—The four perches afforded 7 C. 2 Q. 0 lb. Multiplying this weight by 40, shews our acreable produce to be 15 tons. The quantity indeed but small.—However, the season in which it is to be had, renders it more than ordinary valuable, and I think bids fair, to make it become an object of husbandry, as a pasture for cattle. At present, I shall omit to say any thing further upon this subject, but shall repeat my experiments, in order to come at several facts, which strike me as being very material to be known.

EXPERIMENT the FIFTH.

Rape sown on Wheat Stubble.

Six acres under wheat this year, the land stiff, very inclinable to be wet, but pretty deep, I ploughed, as soon as the wheat came off.—Harrowed it down,
and

Here we see that this experiment totally failed, and is a strong indication, that but little is to be expected from sowing rape upon wheat stubble; because, after the wheat comes off, it seems to be too late in the year to sow the rape.—Something, indeed, may be charged to the natural moisture of the soil, and perhaps to its not being rich, although it is not poor; but I shall repeat this experiment in another way.

Exp. 1. <i>April</i> sowing.	Run, and did not answer the purposes sought for.
Exp. 2. The same.	Transplanted, also run, but not so soon as the other.

Ex. 3.	July 18th sowing.	Single rows, <i>per</i> acre	29	6	1	16
		Double rows, <i>per</i> acre	32	12	2	23
	July 24th	Single rows, <i>per</i> acre	33	14	1	26
		Double rows, <i>per</i> acre	34	18	0	6
Exp. 4.	July 24th.	Broad-cast.	15	0	0	0
Exp. 5.	September sowing	on Wheat stubble	0	0	0	0

Agreeable to the instructions already stated, I sowed half an acre of land with ten stone of oats, and two bushels of sainfoin seed—and half an acre with two bushels of sainfoin seed, *without* any corn.

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self of this opportunity of trying, how far lucerne will improve or impoverish land, for the reception of white-corn.—Accordingly, I ploughed up the lucerne, and on the 25th day of *April*, sowed the half acre of ground with ten stone of oats, and harrowed all fine. —The oats came up very vigorously, and flourished away at a great rate.

On the 16th of *May* there was great rain; on the 18th I sowed over the oats two bushels of sainfoin seed, and bush harrowed,

Adjoining this half acre, in the same field, the ground had been under cabbages—I chose half an acre of this, next to the oats, to sow the sainfoin *without* corn, agreeable to the desire of the Society.—Thus the two experiments for the sainfoin were committed to the ground.

That sown *without* corn, came up so thin, that it required close examination to find the plants; and as sainfoin is very slow the first year, it could make no figure at all; or resistance against its enemies, the weeds, which indeed, rose in such a manner, that I was heartily tired of the experiment, and more ashamed of it, than I can express.—I mowed down the weeds twice, and carried them off by cart loads; they rose again surprizingly, and in short, became so formidable, that nothing was left to be done, but to plough up the ground.

Although it is an idea, which has crept a little way into the world, to sow grass-seeds *without* corn, I presume, from Mr. Miller having recommended it in his Dictionary, yet, repeated trials of my own, both in *England* and *Ireland*, with the experience of some of the most spirited Gentlemen farmers that perhaps any age could ever boast of, induces me to condemn the practice, as being inconsistent with first principles, and *unprofitable in an high degree*, reserving only one doubtful exception, which is lucerne; and that I fear, will never become an object of the farmer, until some more compendious method of cultivation for it shall be discovered,

than

than that, which, by general consent, and experience, of the most ingenious, seems to be the best—namely, *Transplantation*.

In the experiment before us, of sowing sainfoin *without* corn, there can be no exception taken to the ground in point of quality or capability of feeding plants, for it was in an high degree of perfection, both of richness and culture, and would have afforded almost any crop.——That the land is too stiff in its nature for sainfoin, I have no doubt; but however, from the condition of the ground, if sowing sainfoin *without* corn can answer any good, or profitable purpose, it must have had some success here.

Our other half acre, under the oats, upon the lucerne ground, went on, and made such an appearance, as I had never seen oats to make before; every body who saw, admired them as a crop of amazing luxuriance; but the storms of wind and rain which we had on the 18th, 19th, and 23d of *July*, and several other days, determined the fate of these oats, which really promised to be immense; but this weather laid them down so flat, that they never rose again; and they were so thick, that neither sun or air could penetrate them.——In short, when I came to reap them, the men were obliged to cut where they *could*, all one among another, in the most irregular manner that can be conceived, and drawing out the handfuls of straw stinking rotten.

This putrefaction, carried on to so high a degree upon the surface of the ground, not only destroyed all the sainfoin, but did not leave a weed alive, not even a blade of grass to be seen.

The oats, with great difficulty, were got dry, and thrashed; the produce 5 barrels 9 stone, of long, poor, slokey corn, as ever I saw.——Could the corn have stood, I think, if ever half an acre produced 20 barrels, this would have done it.——As to the straw, there was abundance of it, but in thrashing, it half tumbled.

tumbled to dust, and the remainder was fit for nothing but the dunghill, and not good for that.

One part of our enquiry is pretty fully answered by this experiment; viz. as to the quantity of seed oats. It is very plain, that the land was over seeded, and that where ground is in high condition, less seed will answer, than is generally used or imagined; for, it is the received and established opinion, that, the richer the ground, the more seed must be used, and that, most peremptorily asserted as to oats.—I own, I am inclined to think otherwise.

Why the sainfoin failed in both these experiments, is plain. And although the oats turned out in the manner already described, yet, the event lays open an important piece of information, with respect to the nature, and effect of lucerne upon land, and points out an enquiry well worth pursuing hereafter; for indeed, I had no conception of this piece of ground being in so high a state for feeding plants, as it proved to be, because I had not given it any sort of assistance, in point of manure, for seven years.—In the year 1764, it was planted under potatoes, in the ordinary method of the country, and in *March* following, was furnished with transplanted lucerne, and never received any manure since.

Hence we may expect, that if we can come at any compendious method of cultivating lucerne, that it will certainly contribute to the improvement of dry land, for the reception of white-corn.—I propose to attempt it, and shall begin to prepare a part, if not the whole, of a field for that purpose.—At present, nothing can be poorer than it is, insomuch, that I am sure it has not afforded me ten shillings an acre *per annum* as pasture for eight years, and therefore I have fears about being able to accomplish the whole in my first attempt.—However, I intend to lay the whole process, with the nature and quality of the soil, with some comparative trials upon other grasses in the same field, before the publick, as I proceed, as from what has appeared

appeared in the experiments before us, I conceive it to be an attempt of some moment to mankind.

EXPERIMENTS on CABBAGES.

Variety of Experiments, and considerations on Cabbages.

I have already, so often laid before the publick, my ideas of this species of husbandry, that I shall not repeat them here; it is enough, that I have very strong testimonies that the publick think as I do, because many Gentlemen and farmers, even in this kingdom, have embarked in it; and I know several who have found it so profitable, that they are enlarging their plantations with a spirit, which I flatter myself cannot fail, in time, of making cabbages an article of common cultivation through the kingdom.

In order to preserve clearness in what I have now to offer, I shall adhere to my former method, of dividing my experiments in this husbandry, into two sets, in order clearly to distinguish what I call the autumn or winter plants, from those which I call the summer or spring plants*.

First set of Experiments on Cabbages, being Winter Plants.

The kinds under culture this year were,

The Anjou Colewort.	} {	The Flat Dutch Cabbage.
The Scotch Cabbage.		The Red Cabbage.

The

* What I mean by autumn or winter plants, are those, from seed sown in *August*, and the spring or summer plants, those, from seed sown in *March*.

The seeds of these four kinds, were sown in well prepared beds, on the 22d day of *August*, 1769.

On the 30th of *March*, 1770, the plants were put out, in the same ground, which had produced cabbages for two years together before; and they were taken immediately from the seed-beds, without any previous transplanting.—They remained in this state until the 21st of *June*, when I began to horse-hoe them for the first time, and finished on the 23d.—The second, and last hoeing was given on the 16th day of *August*, and finished the 18th.—For the manner of hoeing cabbages, see my Report 1769, page 56.—The plants flourished away at a great rate indeed; and were by much the largest I ever had of the *burd* kind.

The latter end of *October*, I began to use these cabbages for the horned cattle and swine; and they devoured them with the same eagerness, as in former years. In *November*, I found it was necessary to be very liberal in the use of them; for, from the extraordinary wet, and mildness of the weather, I saw the leaves, which were prodigiously large, decaying, and falling off very fast, which was a strong indication, from my former experience, that my *hard* cabbages would not be of long duration this winter; and so I experienced, for the latter end of *November*; there was not an hard cabbage in the field; that had an external leaf left, and many of them of every kind beginning to burst.

This condition of them, obliged me to begin weighing them, which the reader will perceive, must have been at great loss, as the external leaves were totally gone.

November the 28th, one row of the red cabbages, containing 331 plants, weighed 28 C. o Q. 13 lb.—Our ridges were 5 feet wide, and 30 perches long.—Our average weight of these cabbages, *without* any leaves, was 9½ pounds, but I had many that weighed 22 pounds.—Our average distance in the rows 19 inches.

November

November 29th. One row of the *Flat Dutch* containing 326 plants, weighed 29 C. 2 Q. 17 lb. Our average weight per plant, above 10 lb. 3 ounces—many weighed 28 pounds without a leaf.—Our average distance in the rows, about 23 inches, and our ridges 5 feet wide.

November 30th. One row of the *Scotch*, containing 311 plants, weighed 29 C. 0 Q. 7 lb.—Our average weight above 10 lb. 7 ounces—Several weighed 27 pounds without a leaf.—Our average distance in the rows 2 feet, and the ridges 5 feet wide.

The *Anjou Colewort*, I have before informed the publick, sheds its summer leaves, upon the approach of winter.—To come at the probable waste, by not pasturing the leaves in autumn, as I mentioned might be done with sheep, in my last Report, I this year weighed the produce at two seasons—viz. the 27th of *October*, and 5th of *December*.

October the 27th. One row, containing 312 plants, weighed 20 C. 3 Q. 10 lb.—Our average weight above 7½ lb. some so high as 22 lb.—Our average distance 2 feet, and our ridges 5 feet wide.

December the 5th. One row, containing 310 plants, weighed 16 C. 1 Q. 4 lb.—Our average weight 5 lb. 14 oz. some weighed 15 lb.—Our average distance about 2 feet, and our ridges 5 feet wide.

	C.	Q.	lb.	Average. lb. oz.	Largest.
Anjou Colewort, per ridge, <i>October</i> 27th.	20	3	10	7 4	22
Do. <i>Decem.</i> 5th.	16	1	4	5 14	15
Waste in the grofs by not pasturing in autumn.	4	2	6	1 6	per pla. 7 p. p.

RECAPITULATION of the produce of the four kinds of Cabbages from each ridge, 630 feet long, and 5 feet wide, with their average and extraordinary weight per plant, all being winter plants.

Cabbages.	No leaves.	Distances.	C.	Q.	lb.	Average per plant.	Extraordinary plants.
Red	Do.	19½ In. by 5 feet	28	0	13	9½	22 lb.
Flat Dutch	Do.	23 In. by 5 feet	29	2	17	10	28
Scotch	Do.	2 feet by 5	29	0	7	10	27
Anjou	In October	2 feet by 5	20	3	10	7	22
Do.	In December	2 feet by 5	16	1	4	5	15

I shall now state the acreable produce of these four kinds, and compare the whole with the same kinds of last year, (except the red, of which I had no *winter* plants of that year) cultivated upon the same ground.

We have already seen, that our ridges were 30 perches long, which being multiplied by 21, shews they were 630 feet in length, and being 5 feet wide, we are to multiply our length by the breadth, and our answer will be 3150, which are the number of feet of ground in each of our ridges.—This is to be the divisor

divisor of 70560, which are the number of feet in a plantation acre, and our answer will be 22, and a fraction of 1260 feet, or $\frac{1}{12}$ of an acre.

From this data, we are to form our calculations of the acreable produce of the four kinds of cabbages already mentioned.

The Red Cabbage.—A ridge of these we have seen, afforded 28 C. 0 Q. 13 lb.—which, being multiplied by 22, amounts to 30 T. 16 C. 0 Q. To this we are to add our fraction of 1260 feet.—The produce of this plant amounts to about one pound to a foot of ground—Consequently, our fraction of 1260 feet, amounts to 11 C. 1 Q. 0 lb. which being added to the produce of 22 ridges, together, make our acreable produce of the *red cabbage*, 31 T. 7 C. 1 Q.

The Flat Dutch Cabbage. A ridge of these having afforded 29 C. 2 Q. 17 lb. and being multiplied by 22, amounts to 32 T. 12 C. 1 Q. 10 lb.—To this we are to add our fraction of 1260 feet, which in the same proportion, is something more than 16 ounces $\frac{1}{2}$ to a foot of ground—Consequently, our fraction of 1260 feet amounts to 11 C. 3 Q. 2 lb. which being added to the produce of 22 ridges, makes our acreable produce of the flat Dutch cabbage 33 T. 4 C. 0 Q. 12 lb.

The Scotch Cabbage. A ridge of these we have seen, afforded 29 C. 0 Q. 7 lb. which being multiplied by 22, amounts to 31 T. 19 C. 3 Q.—In this proportion, the produce is a pound and half an ounce to a foot—Consequently, our fraction of 1260 feet, amounts to 11 C. 2 Q. 11 lb. 6 oz. which being added to the produce of 22 ridges, makes our acreable produce 32 T. 11 C. 1 Q. 11 lb. 6 oz.

Anjou Colewort. A ridge of these afforded in October 20 C. 3 Q. 10 lb. which being multiplied by 22, amounts to 22 T. 18 C. 1 Q. 24 lb. To this we are to add our fraction of 1260 feet. The proportion of produce of this plant at this time is above 12 ounces

to a foot of ground; consequently our fraction of 1260 feet, amounts to 8 C. 1 Q. 17 lb. which being added to the produce of 22 ridges, makes our acreable produce 23 T. 6 C. 3 Q. 13 lb.

Anjou Colewort. A ridge of these we have seen afforded in *December* 16 C. 1 Q. 4 lb. which being multiplied by 22, amounts to 17 T. 18 C. 1 Q. 4 lb. This produce is in the proportion of above 9 ounces to a foot; consequently, our fraction of 1260 feet, amounts to 6 C. 0 Q. 26 lb. 2 oz. which being added to the produce of 22 ridges, makes our acreable produce 18 T. 4 C. 2 Q. 2 lb. 12 oz.

RECAPITULATION of the acreable produce, of the four kinds of Cabbages, the seeds having been sown in the month of *August*, and the plants put out in the spring.

The Table of Acreable Produce.

	1770			In 1769			None this year		
	T.	C.	Q. lb.	T.	C.	Q. lb.	T.	C.	Q. lb.
The Red	31	7	1 0						
The Flat Dutch	33	4	0 12				38	11	2 3
The Scotch	32	11	1 11				38	4	0 13
The Anjou in <i>October</i>	23	6	3 13				34	13	0 11
Do. in <i>December</i> .	18	4	2 2½						

Here we have at one view, the acreable produce of the four kinds of cabbages before us, with the produce of the same sorts in the year 1769, except the red, and that year I had none of *winter* plants; and there will ever be found such a difference in point of *produce* between summer and winter plants, that they must never be compared together.

I have a few pages back, said, that these cabbages were the largest I ever had, and yet we find, that in the general produce, they are all deficient in point of weight, when compared with the produce of the same kinds in 1769. The reader will recollect that the leaves fell off before weighing, which was a great diminu-

diminution of our produce, and therefore, clearly accounts for the difference. The Anjou Colewort indeed is very far deficient of the former year, which to me is unaccountable; unless, its succession upon the same ground be the cause, which I can hardly think. However, we shall be able to form some judgment of this in 1771, as I have planted the same ground again with Anjou Colewort.

The object of duration, I dwelt upon a good deal last year, and gave a clear table thereof in the 73d, page of my Report for that year. This year we find all the *hard* cabbages went off together, much sooner than in the former year. From the 32d. to the 36th. pages of this Report we may state our table of duration for the plants before us, and in comparison for those who may not happen to have the Report at hand, I shall introduce the same plants from my Report of 1769.

Table of Duration.

In 1769.		In 1770.
No red this year.		
Flat Dutch	} December, and January.	} November.
Scotch		
Anjou Colewort	May.	May.

Here we see a very material difference in point of duration in the two years. A strong lesson to the cabbage farmer, that he is not to rest his whole dependance for winter pasture upon the *hard* cabbage, which we see is so liable to be taken off by mild or wet weather, and still makes a stronger impression upon my mind, of my idea of the cause of the *hard* cabbage not standing with us, as it does in *England*; see my Report 1769, page 69 and 70. Indeed, I am very doubtful, whether what I have hitherto had for the Scotch, has been the true kind. However, I have now got small quantities from five different places in *England*, and we shall be able to form a judgment from them, whether *this* kind of *hard* cabbage will stand with us or not. Indeed

Indeed, I did not get the seeds time enough, to sow them as autumn plants, and therefore they were all sown in spring 1771, the success of which, the publick may expect a very particular and exact account of in my next Report. In the mean time, this circumstance, of the *hard* cabbages going off so much earlier this year than in the former, induces me to recommend to the consideration and close attention of the cabbage farmer, my table of successions in my Report for the year 1769, page 110.

The SECOND SET of EXPERIMENTS upon Cabbages, being the spring or summer Plants.

The Kinds were as follow.

- Nº. 1. The flat Dutch Cabbage.
2. The Green Savoy Cabbage.
3. The large Scotch Cabbage.
4. The Turnip Cabbage.
5. The long sided Cabbage.
6. The Turnip rooted Cabbage.
7. Green Boorcole.

Here we have seven kinds, of which I sowed the seeds on the 2d of April 1770. On the 20th of June we had fine rain. On the 30th I planted out of the preceeding kinds in the following order, ten perches in length, with the most minute exactness that could be, in a field, five acres of which was also planted afterwards with the same kinds.

Nº. 1. Flat Dutch.
1 foot by 4 1 perch 210 plants.
18 Inches by 4 feet 10 Do. 140 Do.
2 feet by 4 10 Do. 105 Do.

Nº. 2.

N^o. 2. Green Savoy.

N ^o .	4	1 foot by 4	10 perches	210 plants.
	5	18 Inches by 4 feet	10 Do.	140 Do.
	6	2 feet by 4	10 Do.	105 Do.

N^o. 3. Scotch.

	7	1 foot by 4	10 Do.	210 Do.
	8	18 Inches by 4 feet	10 Do.	140 Do.
	9	2 feet by 4	10 Do.	105 Do.

N^o. 4. Turnip Cabbage.

	10	1 foot by 4	10 Do.	210 Do.
	11	18 Inches by 4 feet	10 Do.	140 Do.
	12	2 feet by 4	10 Do.	105 Do.

N^o. 5. Long Sided.

	13	1 foot by 4	10 Do.	210 Do.
	14	18 Inches by 4 feet	10 Do.	140 Do.
	15	2 feet by 4	10 Do.	105 Do.

N^o. 6. Turnip Rooted.

	16	1 foot by 4	10 Do.	210 Do.
	17	18 Inches by 4 feet	10 Do.	140 Do.
	18	2 feet by 4	10 Do.	105 Do.

N^o. 7. Boorcole.

	19	1 foot by 4	10 Do.	210 Do.
	20	18 Inches by 4 feet	10 Do.	140 Do.
	21	2 feet by 4	10 Do.	105 Do.

The reader will plainly see, what were the questions to be ascertained by these experiments—viz. distance for planting, and duration. Having those two points in view, I did not suffer the plants to be touched until the 5th of April 1771. On that day, their weight was examined, they having been horse-hoed during the preceeding summer, with the rest of the field, in all five acres under cabbages. This ground had produced cabbages the year before, 1769, and had no additional dressing of manure.

N^o. 1.

Experiments on Cabbages.

N^o. 1. Flat Dutch.

		C. Q. lb.			
N ^o .					
1	1 foot by 4	4	2	2	
2	18 In. by 4 feet	3	2	12	} Several <i>Run</i> , and others <i>decayed</i> .
3	2 feet by 4	3	0	20	

N^o. 2. Green Savoy.

4	1 foot by 4	3	1	18	} Several <i>run</i> , and some <i>decayed</i> .
5	18 In. by 4 feet	2	0	24	
6	2 foot by 4	2	2	8½	

N^o. 3. Scotch.

7	1 foot by 4	3	1	12	} Several <i>run</i> , and others <i>decayed</i> .
8	18 In. by 4 feet	3	0	16	
9	2 feet by 4	2	2	24	

N^o. 4. Turnip Cabbage.

10	1 foot by 4	2	0	12	} Some <i>Rusty</i> , but all <i>sound</i> .
11	18 In. by 4 feet	2	1	6	
12	2 feet by 4	1	3	20	

N^o. 5. Long Sided.

13	1 foot by 4	0	0	0	} In a manner, all melted away.
14	18 In. by 4 feet	0	0	0	
15	2 feet by 4	0	0	0	

N^o. 6. Turnip Rooted Cabbage.

16	1 foot by 4	4	2	18	} All <i>sound</i> . Very <i>small tops</i> .
17	18 In. by 4 feet	3	0	19	
18	2 feet by 4	3	0	6	

N^o. 7. Green Boorcole.

19	1 foot by 4	2	3	4	} All <i>sound</i> , and growing <i>fast</i> .
20	18 In. by 4 feet	2	1	20	
21	2 feet by 4	2	0	26	

Before

Before I make any observations upon this set of experiments, I shall calculate the acreable produce, from the above proportions, as the quantity per acre, strikes the imagination with a clearness, which fractions of acres cannot convey.

		T.	C.	Q. lb.
No. 1. Flat Dutch.				
No. 1.	1 foot by 4 per acre	18	19	2
2.	18 inches by 4 feet ditto	15	3	
3.	2 feet by 4 feet ditto	13	7	
No. 2. Green Savoy.				
4.	1 foot by 4 feet ditto	14	6	2
5.	18 inches by 4 feet ditto	9	6	
6.	2 feet by 4 ditto	10	16	1 14
No. 3. Scotch.				
7.	1 foot by 4 ditto	14	2	
8.	18 inches by 4 feet ditto	13	4	
9.	2 feet by 4 ditto	11	8	
No. 4. Turnip Cabbage.				
10.	1 foot by 4 ditto	8	17	
11.	18 inches by 4 feet ditto	9	13	2
12.	2 feet by 4 ditto	7	18	2
No. 5. Long-Sided.				
13.	1 foot by 4 ditto	0	0	0
14.	18 inches by feet ditto	0	0	0
15.	2 feet by 4 ditto	0	0	0
No. 6. Turnip Rooted.				
16.	1 foot by 4 ditto	19	11	2
17.	18 inches by 4 feet ditto	13	6	1
18.	2 feet by 4 ditto	12	16	2
No. 7. Green Boorcole.				
19.	1 foot by 4 ditto	11	14	
20.	18 inches by 4 feet ditto	10	4	
21.	2 feet by 4 ditto	9	7	2

Here we have the acreable produce of these seven kinds, at their respective distances, which I do not lay before the publick, as being inviting in point of quantity, for that is small in my estimation; for which, there are several ways of accounting—amongst others, the ground not being in very high condition for the growth of cabbages, it having produced a crop the year before—some of the plants quite decayed, and others in a languid state, by keeping them over so very late, to come at the point of duration.—Perhaps the insufficiency of the ground to produce large and vigorous cabbages of the hard kind, was the very reason that any of them stood so long, for it may be remembered, that I have always had them burst much earlier, when they have been large; and I own, from the repeated tryals which I have made, that I very much fear, no *hard* cabbage will be able to stand in this country to any good purpose, much longer than Christmas; but before, and till then, very considerable advantage will arise to the landholder, from a judicious culture of them.

The two questions principally sought after in this set of experiments, are answered pretty satisfactorily, though I think not conclusively. First, as to the distances.—We see chiefly, that, as the distances increase, so our produce diminishes, with only two exceptions—viz. No. 6, although two feet distance, exceeds No. 5, at eighteen inches, 130 hundred, and No. 11 exceeds No. 10, the distances of one foot eighteen inches, 16 hundred. Variations which may arise from different causes, and which are unavoidable in pursuits of this kind.—And in the present case more likely, from the determined object, to let these plants stand through the winter, even though they had all perished thereby because, even that would have afforded us useful information.—But in general, we see, through this whole set of experiments, that the one foot distance has produced the greatest quantity, with only one exception to the contrary No. 10, and 11.—A strong indication of my having hitherto taken too great a distance, as I suggested in my report of last year.—However, let it not be forgotten, that greater distance must always be taken for

for winter, than for summer plants, and for ground naturally rich, than for that of inferior quality; and perhaps my table of distances, both for summer and winter plants, in my report for 1769 page 114, may be found to answer pretty well, though I request the reader will remember that I am not peremptory in the framing of that table.

Our second question in this set of experiments, was the duration of the kinds here chosen.—We see they all produced something, even after letting them remain until *April*, except the long sided.—But all the hard kinds would certainly have weighed more, had they been cut in *November*.—However, the turnip cabbage No. 4; the turnip rooted cabbage No. 6, and the boorcole No. 79 by this set of experiments, seem to be the only kinds, which are to be depended upon in spring; as all the hard kinds appear to be precarious, and therefore, to depend on them at that season, might be very hurtful to the farmer or grazier.

It is true, upon the face of the table of acreable produce, page 41 the turnip cabbage and boorcole, produce less than the precarious kinds, but there certainly is satisfaction in safety, for of these we are sure even in the latest hour in the spring, whatever the quantity may be, because no weather can destroy them.—Besides which, the boorcole will every day improve, until it is in full blossom, which I find in general, will not happen until late in *May*,—the quantity of that being so small in our table of acreable produce, may be safely charged to its being cut, before the spring growth had made any great head.

We see that the turnip rooted cabbage exceeded all the rest in point of produce, which is certainly a great fact gained, and therefore demands the particular attention of the sheep-farmer; as, for any other stock, I conceive it to be a mere nothing.

The principal merit of this plant is in the root.—The objection to it is the labour in getting it up, which cannot be done, without a mattock, or a very strong

three pranged fork.—I had about an acre of it this year, and I was obliged to take that method of raising the plants out of the ground.

I had no sheep, and therefore I had them brought home to the cattle in the yard.—They worked at them, and seemed to be fond of them, for their flavour is agreeable, they are juicy, (though not watery) and I am convinced feeding, but so hard, that the cattle must be habituated to these kind of pastures to eat them—mine did, but the hardness made their mouths bleed, and there was very great waste.—And therefore, where they are grown in quantity for cattle, I should recommend their being chopped with an axe or cleaver into slices, which perhaps, may make them profitable in feeding fat cattle late in the spring, but they should be washed before chopping, as from their infinity of fibrous roots, they bring up a great deal of dirt with them.

It will be unnecessary for me to enlarge upon the state of the several plants in this set of experiments, since the table in page 40, shews the whole at one view.

The five acres under cabbages in this field, were all used for cattle, and swine, as the former year, and answered exceeding well, only that our produce was not so plentiful, as in the former year.

EXPERIMENT ON DRILLED WHEAT.

In my report 1768, page 28, after several reflections, laying before the publick the objections which I have experienced to this cultivation of wheat in successive crops upon the same ground, I suggested that perhaps it might be profitable to sow wheat under the harrow, after the *first* crop of drilled wheat.

That I might be able to lay this before the publick with more certainty, than mere matter of reflection can afford, I was determined to put it in practice in a pretty extensive way, in order to have the exhibition large,

large, for the inspection of such gentlemen and farmers, as should come and see it.

To this end, I prepared by fallow, *twelve* plantation acres, and drilled them with common white wheat, on five feet ridges, from the 9th to the 14th of *October*, 1769. The quantity of seed *five* stone and *four* pounds per acre. The land, a kind strong loam, constantly under tillage, and I believe never received any manure.

The corn came up very well—was three times horse-hoed, and the strongest weeds taken out. The crop made a pleasing and promising appearance; and I did imagine, would have truned out much more prolifick, than it proved to be.—But it was a good deal smutted, and suffered prodigiously on the north side of the field from the sparrows, where they had a large full grown hedge to lodge upon.—What the smut was owing to, I shall not pretend to determine, as, in my former reports, I have laid before the publick, my sentiments upon that disease, to which all white-corn, and wheat in particular, is liable—I shall only just remark, that we had a good deal of *rain*, much *bazy weather*, and the wind chiefly at *west* in *July*, attended with *cold*, all which, I have, repeatedly observed to be very hurtful to the wheat in this country.—Whether these are the causes which produce the smut, and other diseases upon wheat, I shall not say; but for my reflections upon it, I beg to refer the reader to my reports of 1764 and 1768.

Dr.

Dr. DRILLED WHEAT THE LAND-TYTH FREE.

		l.	s.	d.	
1769	To ploughing 12 acres 4 times at 10s.	24	0	0	
	To harrowing ditto 3 times at 2s	3	12	0	
	T drill harrowing at 4 $\frac{1}{2}$ per acre		4	6	
	To drilling the feed-corn		8	6	
	To seed-wheat 3 bar. 3 ft. 6 lb.	3	3	5	
	To rent for the year of fallow at 18s.	10	16	0	
	To county fess		14	5	
1770	To three horse-hoings at 20d per acre	3	0	0	
	To weeding		0	9	0
	To reaping and binding	1	19	0	
	To drawing home, and putting in the barn	0	18	0	
	To rent for the year of growth	10	16	0	
	To the county fess		0	12	0
	To thrashing and winnowing 53 bar. } 4 ft. at 12d.	2	13	2	
		<hr/>			
		63	6	0	
	To net profit	17	5	3	
		<hr/>			
		80	11	3	

12 ACRES per PRODUCE Cr.

		l.	s.	d.
1770 By produce of wheat 53 bar. 4 ft.	}	66	10	0
at 25s.				
By straw 93 load 3 hundred at 3s	}	14	1	3
per load or 9d per hund:				
		<hr/>		
		80	11	3

Here we have a profit of £17 5 3 upon twelve acres which is £1 8 9 $\frac{1}{4}$ per acre.—A profit, which, in my estimation, is not to be boasted of, after two years labour; and yet, I wish every crop of fallow-wheat in the kingdom would produce as much.—In the present case, and from the small produce, I own I expected, upon stating the account, that there would have been loss, because, the expences of preparing fallow, even *without* manure, will ever be great.—The profit before us, coming out upon the first crop, is favourable to the present enquiry.—And in order to carry it on, I have sown the same ground with wheat, under the harrow; and in my report for the year 1771, I will lay before the publick, the result, of that continuation of the experiment, and then bring the whole into one view; by which, we shall be able to form a pretty clear judgment, how far the drill husbandry will be capable of rendering land fit for such a succession of wheat crops; and therefore, as the principal object of the experiment is yet depending, I shall dismiss this subject for the present.

Some account of the SUMMER maintenance of *Horned-cattle, Horses, and Swine, upon Broad-Clover.*

In my report for last year, 1769, I was pretty full upon this subject.—The field devoted to the purpose was twelve acres.—I beg to call upon the attention of the reader with respect to this field, because it will be the subject in my report 1771, of a culture, so interesting to the farmer and the community, that it cannot be too much attended to.

My report for last year, shewed how the clover of this field was disposed of; the stock it maintained, and how long, with the manner of using the clover. From necessity, and *not from choice*, I was obliged to continue it under clover this year 1770.—As I despaired of the ground being in sufficient vigour to afford a mowing crop the *second* year, I pastured it.—Though I believe, contrary to the received opinion, that where land is in good condition, clover will mow to profit,
even

even the *second* year, but I will ascertain this fact next year, of which the publick shall receive information, in my report for that year.

I shall now lay before the reader, the stock which this field maintained last summer.

On the 27th day of *April*, eight horses were turned into this field, and remained there until the 13th of *June*.

On the 8th day of *May*, forty-three pigs were turned in, and remained there, until the 13th of *June*.

On the 9th day of *May*, four large plough bullocks were turned in, and remained there until the 13th of *June*.

On the 12th day of *May*, four milking cows were turned in, and remained there until the 13th of *June*.

On the 13th day of *July*, eight horses were turned in again, and remained there until the 23d of *August*.

On the same day, four large plough bullocks were turned in, and remained there until the 16th of *August*.

On the same day, forty-three pigs were turned in, and they remained there until the 27th of *September*.

Produce of this field by grazing in the summer 1770.

To eight horses, from the 27th day of <i>April</i> to the 13th day of <i>June</i> , being 47 days, at 5d per horse per day	l. s. d. 7 16 8
To 43 pigs, from the 8th of <i>May</i> , to the 13th of <i>June</i> , being 36 days, at 1d per pig per day	6 9 0
To four plough bullocks, from the 9th of <i>May</i> , to the 13th of <i>June</i> , being 35 days, at 3d per day per bullock	1 15 0
To four milking cows, from the 12th of <i>May</i> , to the 13th of <i>June</i> , being 32 days at 3d. per cow per day	1 12 0

	£.	s.	d.
Brought over	17	12	8
To eight horses, from the 13th of <i>July</i> , to the 23d of <i>August</i> , being 41 days, at 5d. per day per horse	6	16	8
To four plough bullocks, from the 13th of <i>July</i> , to the 16th day of <i>August</i> , being 34 days, at 3d per bullock per day	1	14	0
To 43 pigs, from the 13th of <i>July</i> , to the 27th day of <i>September</i> , being 76 days, at 1d per pig per day	13	12	4
	39	15	8

The sum total of this account, I own, astonishes me ; and shews, that the *pasturing* of ground affords such profit, as would induce me, instantly, to hide this account for ever from the publick, lest it might contribute to the injury of *tillage*, had I not *that important object* in sight, in the subject before us. The amount of this pasturing so surprizes me, that it has determined me for ever hereafter, to keep an accurate account of the number, and kind of cattle, I may turn into any field upon my farm, and the time they remain there.

Perhaps, some may imagine, that I have valued the pasturing of this stock too high. Fearing that, was the very reason, which prevented my putting some price upon the stock, which this field maintained last year ; but several Gentlemen having expressed their wish that I had done it, and that I now find it is necessary I should, because this field will afford matter hereafter, which I promise myself, will be interesting to the publick, because I hope it will be instructive and profitable to the farmer.

As to the prices just stated, I conceive *five* pence a piece for horses to be very moderate, *three* pence for a plough bullock, I apprehend to be full low enough, and *three* pence for a milking cow, during the summer months

months, I apprehend, cannot be called dear; but any reader who may have exceptions to these charges, can easily state the account at what price he pleases, for his own information. As to the swine, I am not so clear about: I think *one* penny per day is full low, and yet, from the value of the swine, I think the price high enough; for, in putting a value upon the pasturing any stock, if we charge more than the improvement of the beast is worth, or more than the labour of working cattle is worth, we should certainly charge too much. No man will think the labour of the horse (particularly such as mine, which are strong able cattle of a good price) worth so little as *five* pence per day, or that of the plough bullock at *three* pence; and as to the cows, they are surely cheap at *three* pence; for if we value the milk at *one* penny a quart, it must be a poor cow indeed, that does not pay more than the pasture, since, from *six* to *twelve* quarts and upwards, is very frequent for a cow to give in the summer months.

As I intend the field before us, to go on in a constant succession of crops, without intermission, (somewhat similar to what I have proposed to the Society by way of premiums, in my *Practical Agriculture Epitomized*) for the information of the publick, until I find a check, by it's failing in produce, I shall now, not only put a price upon the stock it maintained last year, but also remind the reader of the crops it has produced for some years, *without intermission*; and I hope the size of the field, will be a strong confirmation to the reader, of the impossibility of its being favoured in any respect by manure, of which it has received none, since the summer 1765, save about six acres, at the poorest end of the field, which was dressed with the potatoe compost, in the winter 1770, from a ridge of potatoes which run the whole length of the field the year before, upon the north-east headland, and of which, the proper charge will be made presently, in the general account of loss and gain.

In the year 1766, Under various Experiments.

In the year 1767, Under Wheat.

In the year 1768, Under Oats.

In the year 1769, Under Clover, mowed for cattle, as mentioned in my Report of that year.

In the year 1770, Under Clover, grazed, as just mentioned.

In the year 1771, *Now* under Wheat.

An Account, and value, of the maintenance of the Stock, which this field supported in the year 1769, by grazing a part, and mowing the remainder of the clover, as described in my Report for that year.

	£.	s.	d.
By maintaining 83 head of swine, from the 24th day of <i>May</i> , until the 26th day of <i>August</i> , being 94 days, at 1d. per head per day	32	10	2
By maintaining 9 horses, from the 10th of <i>May</i> , to the 6th of <i>June</i> , by grazing 2 acres which were intended for seed, 27 days, at 5d. per head	5	1	3
By maintaining nine horses, from the 6th of <i>June</i> , until the 29th of <i>September</i> , being 115 days, at 5d. an horse per day	21	11	3
By maintaining four plough bullocks the same time, at 3d.	5	15	•
By maintaining three milking cows the same time, at 3d. each per day	4	6	3
Carried over	69	3	11

upon Broad Clover.

53

	£.	s.	d.
Brought over	69	3	11
By maintaining 31 head of running stock the same time, which I shall charge only at <i>one penny</i> per head upon an average, as it may be remembered, they run upon a common in the day time	14	12	1
	83	16	0
By eight load of clover hay	2	0	0
	£ 85	16	0

As I intend to bring this field into my Reports every year for the future, I shall now state the account Dr. and Cr. for the two past years; and it is with particular concern that I cannot, at present, state the expence and produce of the preceding years; but against my next Report, or perhaps before I print this, I will look over my accounts, to see whether I can ascertain those points with that exactness which I wish to lay them before the publick, and which I might do immediately, were it not for some causes, which I shall avoid to trouble the reader with.

In the form in which I now mean to lay this field before the publick, I think it necessary to describe the quantity of ground exactly; and upon looking at the map of my farm, I perceive I have made a mistake in calling the field 12 acres, in my last Report; that idea has been so strong upon my mind, from the tillage part I suppose being thereabouts, that I could not have looked at the map. I now find the gross contents to be 13 A. 2 R. 18 P. However, as the field is now circumstanced, there will be a good deal of waste ground, from a corner of grass, two broad headlands, ditches, &c.

Dr

Dr. The Field, No. 10, in my present Map,

	£.	s.	d.
1768. To Cash by Clover seed, 2C. 1Q. } at 3 ^l . - - - - - }	6	15	0
To sowing, bush-harrowing and rolling - - - - - }	11	0	
1769. To picking the stones in heaps, by task, cost (too dear) - - - }	1	13	4
To drawing them off, for drains in other fields - - - - }	1	8	11½
To a man mowing and drawing home clover 94 days, at 8 ^d . - }	3	2	8
To an horse drawing home the clover 94 days, at 1 ^s . - - }	4	14	0
To mowing and making 8 load of hay, at 1 ^s . - - - - }	8	0	
To mowing, and struggling to save 2 acres for seed - - - }	18	0	
To repair of fences - - - - }	12	0	
To one year's rent of 13 A. 2 R. } 18 P. at 18 ^s . - - - - }	12	5	0
To county Cefs, for this field's proportion - - - - }	14	5	
To drawing out the dung for 60 perches of potatoe ground upon the north-east side, for men and horses - - - - }	11	0	
To men for planting the potatoes	12	0	
To seed potatoes, 30 stone	15	0	
To digging the potatoes	18	0	
To ploughing and harrowing the potatoe ridge, to mix the manure }	2	7	
To filling and drawing out the manure upon 6 acres - - }	4	18	0
To spreading ditto - - - - }	1	4	0
To bush-harrowing and rolling	6	0	
	<hr/>	<hr/>	<hr/>
	42	8	11½
To net profit in 1769	49	7	0½
	<hr/>	<hr/>	<hr/>
	£ 91	16	0

upon Broad Clover.

55

13 Acres, 2 Roods, 18 Perches.

Cr.

	£.	s.	d.
1769. By maintaining the stock, as stated in the 52d page	83	16	0
By eight load of clover hay, at 5s.	2	0	0
By 2 acres for seed, totally lost by rain	0	0	0
By potatoes from the headland.—I have not a distinct account of the exact produce, but they were very good, and the ridge was broad, and therefore I think I may safely value them a barrel to 3 perch	6	0	0
	<hr/>		
	£	91	16 0

£ 91 16 0

Here we see a net profit comes out of £49 7 0, (even after such very heavy charges,) which is £3 12 5 per acre. I should imagine, we need nothing stronger, to recommend clover to the attention of the farmer. I own, for my part, I had no conception that it could afford such prodigious credit, much less such profit, after the heavy expences which I brought upon it. Picking and drawing off the stones, is an enormous weight upon the profits, to which other land may not be liable. They were so thick in a part of this field, as to lie one upon another, and will be a constant expence for some years, as at every ploughing they will rise; but I will persevere, by which, I do not despair of banishing this intruder; and surely there must be pleasure in the pursuit, when we see the expence is repaid as we go on.

Dr. The same Field, No. 10, in my present Map.

	l.	s.	d.
1770.			
To a boy keeping the swine 112 days, at 4d.*	1	17	4
To a man mowing weeds 7 days, at 8d.		4	8
To repair of fences		10	0
To one year's rent of 13A. 2R. 18P. at 18s.	12	5	0
To county Cels this year		13	1
		<hr/>	
		15	10 1
To net profit		24	5 7
		<hr/>	
		£39	15 8
		<hr/>	

* This charge for keeping the swine is heavy, and shews, beyond dispute, how much more expensive it is to have our fences and gates imperfect, than in the most capital order. £1 17, is the interest of £37 at 5 per Cent. Now, if even that sum were laid out to render the fences and gates permanent, calculation will shew how the saving the expence of *tenders* would rise in interest. The 2d year of such expence, would make it £10 per Cent, the 3d £15, and so on. By this reasoning, we see how soon, even very heavy expences in improvement will be repaid. To be sure, he who has not the larger sum, must submit to expend the smaller, by which, *his* expences will be greater, *very much greater*, than those of the stronger man. This is the destruction of all poor people in every pursuit.

By Produce

1770.

By produce, as stated in page 42

			Cr.
l.	s.	d.	
39	15	8	
<hr/>			

<hr/>		
£39	15	8
<hr/>		

By

By net profit in the year 1769	£49 7 0½
By net profit in the year 1770	24 5 7
	<hr/>
Total profit of two years	73 12 7½
	<hr/>
Average per an.	£36 16 3¾
Average per acre per an.	£2 14 0
By net profit in the year 1769	£49 7 0½
By net profit in the year 1770	24 5 7
	<hr/>
Net profit greater the first year than the 2d by	25 1 5½
	<hr/>
Net profit in the year 1769 per acre	£3 12 5
Net profit per acre in 1770	1 15 7
	<hr/>
Net profit per acre greater the 1st year than the 2d by	} 1 16 10

These strike me, as being important facts. The acreable profit in each year, in my mind, is very great, and I am sure such, as the tillage acres through the kingdom cannot come near.

But the great difference in the two years, opens a tempting field for enquiry; viz.

Whether it is worth while, to let the clover stand for the second year, notwithstanding the profit is considerable?

Whether it is more profitable to plough it up at *Michaelmas*, after mowing the clover twice, and to throw in wheat?

Or whether more profitable to pasture the second year? Or whether, upon a fair comparison, the clover will yield most profit by grazing or mowing?

Whether best for wheat after grazing or mowing? And if grazing shall be most profitable, what kind of stock is most advantageous to pasture upon it?

These,

These, with several other important enquiries, strike me at present, and I shall endeavour to pursue them, as being of the greatest moment to the farmer and community.

Having more than once, in the course of my relation of this field, mentioned my intention, of continuing it under a succession of crops, for the view, and information of the publick, and that consequently it will, every year hereafter, have a place in my Reports, I shall here give an account of the process and expence of putting the crop in the ground, which the field now carries.

The reader will observe, that on the 29th of September, 1770, this field *stands clear of all expences*, as by the account stated in page 56, and that, in that account, a charge has been made of mowing the weeds, which was to prevent their running to seed, to the annoyance of the succeeding crop.

I have frequently mentioned to the SOCIETY, the vast expence it is to the farmer, to prepare land by fallow, for the reception of wheat; and, that clover-lays, *properly* managed, will produce excellent crops of that grain: many Gentlemen and farmers, have frequently heard me urge the same; and to many of both who visited me last summer, I told my intention of sowing the field before us, with wheat at *Michaelmas*. — Several of them retained this declaration upon their minds, and have held the success so doubtful, that they have come this summer, 1771, to look at the wheat, which I own I have had great pleasure in shewing*.

* The reader will indulge me here with this remark; that this very event, of people coming in a second year, to see a species of culture carried into execution which they held doubtful of success, shews clearly, the publick utility of carrying on experiments in this manner.

I shall

I shall not here give any account of the crop, that will have a place in my next Report, but I shall now lay before the reader, the account of expence in committing the seed wheat to the ground.

Dr. Wheat Seeding 1770, in Field, No. 10. on Clover-Lay 2d year, mowed twice the *first*, and grazed the *second*.

1770. Sept. 28, to October 26th, To nineteen ploughs and half, at four shillings a plough per day; one with <i>four</i> horses, and the other <i>four</i> bullocks	l. s. d.
	3 18 0
To two ploughmen, nineteen and half days, at ten pence per day.	0 16 3
To twenty harrows, two horses in each pair, at two shillings.	2 0 0
To a boy twenty days driving do. at four pence	0 6 8
To the seedsman for sowing the seed	0 4 5½
To seed wheat, 5 bar. 12 ft. ½, at twenty-five shillings per bar.	7 0 7½
To labourers for water-cutting the field	1 11 5
To shoveling about an acre and half, at the wet end of the field	0 3 11½
	<hr/>
	£ 16 1 4¼

It perhaps may be a matter of surprize, that I should be, from the 28th of *September*, to the 26th of *October*, sowing this ground; but it was for a reason, which renders *this* sowing of wheat particularly happy; for, when rain came, we were obliged to quit the fallow sowing, and return to this, which we could proceed with, when we could not, or rather, must not stir upon the fallows; so that, this field was rather kept as a standing business, which might go on, when the other could not; a circumstance which I own, did not occur to me, until experience pointed it out: —At the same time, it will hardly be imagined, that even

even *this* can be done in an husband-like manner, when *very heavy* rain falls; but what I would be understood to urge is, that it can be entered upon much sooner after heavy rain, than fallow can, and I have reason to believe, from the appearance of the corn, will produce at least as good, if not a better crop, upon ground of equal quality.

In the progress of this business, I made it a point to finish sowing every evening, what was ploughed in the day, otherwise, heavy rain would have made the ground greasy, and thereby have interrupted this sowing, as well as that on fallow; and therefore, to whoever shall adopt this culture of wheat, I recommend particular attention to that circumstance:—At the same time they will find that some rain will be necessary before they begin to plough up the lay, to make the ground rise kind and mellow, and by letting the seedman follow the plough, and the harrows the seedman, the ground will harrow brittle and kindly, and most completely cover the seed.—And therefore, if the ground be dry, and of a strong kind, it will be prudent to wait for a little rain, otherwise the sod will rise strong, and consequently not *crumble* from the plough, which (to *crumble*) is the criterion of fit condition for the harrow, and thereby, great interstices will be left by the sods standing too erect, and the seed falling therein, will be over covered.—In that case, one brush of the harrows should precede the seedman.—A few of my ridges were in this way, and I pursued that method, and found it prudent and useful.

As we finished sowing, I caused one of the ploughs to return to the furrows, and throw up one sod out of each, which left all the furrows clean, to admit the water to pass freely into the water-cuts; which, by the sum charged for that part of the work, the reader will imagine was done pretty spiritedly.

In the sowing this wheat, I pursued a method, which I never practised before, but I never shall depart from it again, since I find how much moment it is of; namely this.—I was determined to be very accurate in

in the quantity of seed to be sown in all my wheat fields this year, and therefore I took off the length and breadth of each from my map, making allowances for ditches, and other waste ground; calculated how many perch along the headlands would make an acre across the field, and gave the seedsmen a measure and pegs to lay out each acre; and in each sack, gave him ten stone of seed, and no more, for each acre; not attending minutely to any little variations, which the bevel, or other small irregularity of the field, might create; so that I cannot pronounce at present with minute exactness, how much of the ground is under corn, but I will have it accurately surveyed, against I come to give further particulars in my next Report.

We have seen, that the total expence of getting this wheat into the ground, including seed, and that at 25s. a barrel, workmanship, and cattle of every kind, amounts to no more than £ 16 1 4 $\frac{1}{4}$.—If there are *twelve* acres under corn, which I suppose to be about the matter, it amounts to £ 1 6 9 $\frac{1}{4}$ per acre.

If the reader will be so kind, as to turn to the 55th page of my Report for the year 1765, he will find the expence of cultivating wheat in the ordinary method by fallow, to be £ 5 7s. per acre, including the year's rent for fallow, and the rent for the year of growth.—Let us deduct 18s for the latter, and the charge of putting the wheat in the ground will be £ 4 9.—In that case, the 12 acres before us, would have cost £ 53 8.—Let us examine the difference.

To sowing 12 acres of wheat, by the fallow	l. s. d.
preparation, without any manure	53 8 0
To sowing 12 acres on clover-lay	16 1 4 $\frac{1}{4}$
	<hr/>
	£ 37 6 7 $\frac{1}{4}$

Here we see, that the fallow preparation amounts to £ 37 6 7 more than the clover-lay, upon twelve acres of wheat, when it is got in ground.

This

This is immense to the tillage farmer; but let us trace the difference yet farther, which the subject before us clearly admits of.

By a fallow preparation for, and sowing *twelve* acres of wheat, the *fallow* farmer incurs an expence of £37 6 7 *more* than the other with his clover preparation, and sowing the same quantity of ground will cost.—Whilst the fallow farmer is preparing the fallow, at great labour and application, and consuming an whole year in the doing it, the clover farmer is making a profit upon the ground which *he* intends for wheat—of, if we take the first year £3 12 5 per acre.—If we take the average of the two years.—of £2 14s.—And if we take the last year, of £1 15 7.—I shall premise, that at present, I do conceive it the best way to sow wheat after mowing the clover twice the *first* year.—Now, in order to state the comparison fairly between the *two preparations*, we have a right to add the clover farmer's gain, to the fallow farmer's loss, because there is clearly that difference in the expence of the two methods.

First state of the case.

The fallow farmer, in preparing twelve acres of land for wheat, incurs a greater expence, when his sowing is finished, than the clover farmer by	}	l.	s.	d.
The clover farmer, in preparing his ground for wheat, if the <i>first</i> year, gains upon twelve acres	}	l.	s.	d.

Total difference on 12 acres	£80 15 7½
------------------------------	-----------

Second

Second state of the case.

The fallow farmer, in preparing twelve acres of land for wheat, incurs a greater expence, when his sowing is finished, than the clover farmer	}	l.	s.	d.
		37	6	7½
The clover farmer, in preparing his ground for wheat, if we take only the average of two years clover before stated, gains upon twelve acres	}	32	8	0

Total difference on 12 acres £ 69 14 7½

Third state of the case.

The fallow farmer, in preparing twelve acres of land for wheat, incurs a greater expence, when his wheat sowing is finished, than the clover farmer, by	}	37	6	7½
The clover farmer, in preparing his ground for wheat, if we take only the profit, even of the last year, gains upon 12 acres	}	21	7	0

Total difference on 12 acres £ 58 13 7½

The *first state* of the case, makes a difference in the expence per acre, of £6 14 7½.

The *second state* of the case, makes a difference in the expence per acre, of £5 16 2½.

And, the *third state* of the case, makes a difference in the expence per acre, of £4 17 9½.

Thus I have stated this difference in the three ways, which the preceding accounts admit of, for the fullest satisfaction and information of the reader.—If any one shall imagine the first state of the case too high, whereby the difference appears to be £6 14 7½ an acre, I shall be allowed to think the third too low, and therefore

therefore, what seems to be the unerring proportion, is the second state of the case, whereby the difference is £5 16 2½ an acre.—So that it is manifest, that the fallow preparation must produce more wheat by £5 16 2½, than the clover-lay, to be upon an equality.—This I think is the clear result of the question before us.—What fallow upon earth, the land being of equal quality in both cases, can come up to that, I must submit to the fallow farmer to find out.

Wheat is certainly the most important, because it is the most valuable grain upon earth.—The common manner of cultivating of it is slow, and expensive to such a degree, that I am persuaded half the wheat which is grown in the kingdom, stands the farmer in more than he sells it for, were he to charge his own labour, and that of his cattle.

A cheaper preparation for it, than that of fallow, is therefore wanting.—Clover, I look upon it, affords one happy method; there are several other articles within the farmers department, which I imagine will also contribute to this great and fundamental support of mankind, upon which, I shall proceed to make proper trials before I say more about them, than I have done in my introductory paper to this work, and in my *Practical Agriculture Epitomiz'd*.—How the wheat on the clover-lay, now depending, will produce I can say nothing to at present; but the crop is of such kind, that I only wish every farmer in the kingdom, to see it at this hour; as it is an *even, clean, fair* crop, which I own I am not a little proud of.

I shall for this year, close upon this subject; and only presume to wish the Society to consider the importance of the object, to the farmer, and the community; as I really think, for an infinity of reasons which might be offered, they could not direct the liberality of their institution, to any object of more immediate consequence to the nation.

66 Summer maintenance of Horned Cattle, &c.

And what renders this species of culture, more than ordinary promising is, that the simplest operations, and simplest machines, (provided they are fit for work) will perform all the business.

SECOND EXPERIMENT, *on the Summer maintenance of Horned Cattle, Horses and Swine, upon broad red Clover.*

The field under this experiment, is No. 19, in my Map, and contains *gross* measure 4A. 2R. 10P. And for eight years has been as follows.

In the year 1763. Two acres under potatoes, the rest fallow.

In the year 1764. Under Turnips and Cabbages.

In the year 1765. Under Cabbages.

In the year 1766. *Winter* Oats, and Wheat, both drilled, and a slip under spring Oats *broad-cast*.

In the year 1767. Under fallow.

In the year 1768. Wheat drilled different kinds, in alternate rows.

In the year 1769. Under Oats *broad-cast*, and sown with clover.

In the year 1770. Under clover, the use of which is to be our present subject.

This field is bevel on one side, and in order to have it square for my former culture upon it, I sowed a slip with oats, *broad-cast* in 1766, and ray grafs. The latter to save the seed myself, which, to purchase in *Dublin* is 18s. a barrel.

The potatoes at each end, (as described in my Report last year,) for *improving* the fence, giving a *drip* to the falling rains, enlarging the *profitable ground*, and making the *compost*, occupied 0A. 1R. 21P. the clover 3A. 0R. 26P. and they ray grafs, ditches, and waste ground, 1A. 0R. 3P. making in the whole, our 4A. 2R. 10P.

On

On the 13th of *June*, I began to mow the clover for eight horses, four plough bullocks, and 43 pigs, which continued to supply them until the 13th of *July*.

As the large field No. 10, afforded pasture enough, I kept the *second* growth of this clover for hay, which I mowed on the 2d of *August*; and upon the most moderate calculation, it produced 20 loads of excellent hay.

On the 15th of *September*, there was again, a very fine growth of clover upon the field, which I could not turn into before, on account of the potatoes. However, imagining the horses would now rather lie upon the clover, than the potatoe tops, which were now become hard, I ventured to turn in eight horses, which remained here until the 8th of *October*.

The ray grafs afforded *five* barrels of seed, which, at the *Dublin* price, would amount to 4*l.* 10*s.* I shall only value it at half that price. And hay 4 load.

At each end of the field, I had three ridges of potatoes, for the purposes before mentioned, which altogether made 135 perch, *running* measure.

Besides these, I had a ridge on one side of the field, 33 perches long, which I let for 13*s.* 9*d.*

The 135 perch which I planted myself, produced 41 barrels and 7 stone of potatoes, which I value at six shillings a barrel, though I sold many barrels this year at ten shillings, but I put this value upon them, rather as an average price, little and big, as they run.

What the produce of oats and potatoes were in the year 1769, I have no distinct account of, but both were good crops; and the potatoes I am sure, more than paid the expence of manuring the field with the compo't of the potatoe ridges, in the manner I described in my Report of last year, and therefore I shall not introduce that expence in this account.

But I manured the field again this winter, and shall introduce that expence, by which, I presume we shall find, that the potatoes, the second year, more than paid the expence.

Preparatory to planting the potatoes, I was obliged to take down the back of the ditch, which cost me *eleven pence* a perch, and is 24 perches long, and amounts to 22*s*.

Drawing out the dung for 135 perches of potatoe ridges, men and horses, came to 15*s*. Planting the potatoes to £1 2 6. Seed potatoes I was obliged to purchase, which cost me 40*s*. Weeding them cost 2*s*. 6*d*. Digging them was done by task, for which I paid *seven pence* a barrel, and came to £1 4 1.

For ploughing and harrowing the potatoe ridges twice, after digging the potatoes, in order to mix the earth and dung, men and cattle, came to 5*s*. 2*d*.

Labourers filling the manure, cost £2 1 0, Horses, at 12*s* each, come to £2 3 0. Spreading the manure, 52 rows, by task, at 5*d* a row, come to £1 1 8.

Bush-harrowing twice, for horse and driver, came to 2*s*. 1½*d*. Rolling twice, came to the same.

Picking up the stones and laying them in heaps, cost me, by the employment of children, 14*s*. and drawing them off, for men and horses 15*s*. The draft was pretty long; as I intend them for drains in another field, where no stones are.

From these particulars, I shall state the account of loss and gain upon this field, for this year 1770.

Dr.

70 Summer maintenance of Horned Cattle, &c.

Dr. The Field No. 19, Containing in the Gross
4 Acres 2 Roods 10 Perches.

	l.	s.	d.
1769 To Cash by Clover seed 3Q. olb. at 52s	1	19	0
To Bush-harrowing rolling, and sowing	0	2	7½
1770 To taking down, and dressing the back of the ditch, 24 perches at 11d.	1	2	0
To drawing out the dung for 135 perches of potatoe ridges, for men and horses	0	15	0
To labourers for planting the potatoes	1	2	6
To Cash for seed Potatoes	2	0	0
To Labourers weeding Do.	0	2	6
To Do. digging 41 bar. 7 Stone at 7d	1	4	1
To ploughing and harrowing the pota- toe ridges twice to mix the manure	0	5	2
To Labourers filling the manure	2	1	0
To 43 horses drawing out Do.	2	3	0
To Labourers spreading the manure, 52 rows at 5d	1	1	8
To Bush-harrowing and rolling twice	0	4	3
To Children for picking up the stones	0	14	0
To Men and horses, drawing them off	0	15	0
To a Man mowing, and bringing home the clover 30 days at 8d.	1	0	0
To an horse chiefly employed in draw- ing home the clover, 30 days at 12d	1	10	0
To Mowing the second crop of clover	0	9	6
To making it into hay	0	18	0
To drawing it home and ricking	0	6	0
To Mowing, making, drawing and thrashing ray grafs	0	5	0
To one years rent of 4 A. 2 R. 10 P. at 18s.	4	2	1½
To County Cefs, this field's proportion	0	4	1
	<hr/>		
	£24	6	6
To Balance by net profit	12	10	11
	<hr/>		
	£36	17	5

Summer maintenance of Horned Cattle, &c. 71

By Produce

Cr.

	l.	s.	d.
1770 By maintaining <i>eight</i> horses from the 13th of <i>June</i> , to the 13th of <i>July</i> , being 30 days, at 5 <i>d</i> per horse per day	5	0	0
By maintaining <i>four</i> plough bullocks, the same time, at 3 <i>d</i> each per day	1	10	0
By maintaining 43 pigs the same time at 1 <i>d</i>	5	7	6
By 20 loads of clover hay, at 5 <i>s</i>	5	0	0
By maintaining <i>eight</i> horses, from the 15th of <i>September</i> to the 8th of <i>October</i> , being 23 days, at 5 <i>d</i> each per day	3	16	8
	<hr/>		
	£20	14	2

✱ It is worthy of observation here, that
3 A. 0 R. 26 P. of clover produced this sum
of £20 14 2, which is £6 12 6 an acre.

By 5 barrels of ray grafs feed at 9 <i>s</i>	2	5	0
By 4 load of ray grafs hay, <i>indifferent</i> at 4 <i>s</i>		16	0
By 41 barrels 7 stone of potatoes at 6 <i>s</i>	12	8	0
By a ridge on one side of the field let for	0	13	9
	<hr/>		
	£36	17	9

It is with particular pleasure, that I lay this account before the publick, because it affords several striking particulars of information; and although it does not amount to quite so much per acre in the gross produce upon the clover, in the first year, as the last field mentioned; yet, the greatness of it, uniformly shews the value of clover, and of which, I own, I had no conception, until I came to make these enquiries. £6 12, and £7 an acre gross produce, without any additional tillage, is, in my mind, a prodigious thing; and from the knowledge I have of the nature of my ground, compared with other land, I retain very little doubt, but that clover may be brought to afford a crop, worth 10l. an acre upon some ground; for, although both the fields before us, made a fine appearance, and were considered by the many who saw them, to be fine crops; yet, when I recollect the clover I have had, and have often seen with others in *England*, I cannot consider the crops before us, as being at the freight of what I think may be obtained.

The charges on the debit side of the account, the reader may observe, are very high, and yet, there comes out a net profit, of £12 10 11, which, even after all the charges made, is £2 15 0 per acre.

- This I conceive, must be a persuasive lesson to all improvers, that if they lay out money *judiciously* upon ground, they need not fear being amply repaid their expence.

But above all, in such pursuits, they should calculate to have their draft on manures, as short as possible. Upon this field, I put out 900 loads of the potatoe compost per acre, and by its being at *each end* of the field, the farthest load was not 20 perches, and every load, shortened the draft in each row, because, from one end, I only drew to the middle of the field, and after finishing there, began at the other end, and so met that already put out, half-way. These are the methods which give dispatch to heavy work, and execute with cheapness.

cheapness. And in this kind of business, particular attention should be given, to the proportioning the men to the cattle, in such a manner, that one shall not wait for the other, and to have them well attended by the master, or some other person of authority, and *integrity*.*.

I might cover many more pages with this subject, by dividing the several articles produced in this field, into distinct accounts, of expence and profit; and I believe we should find them all more or less profitable, independant of each other; but I shall only do that in one particular—*viz.* the potatoe culture, in order to shew accurately, whether the potatoes do, or do not pay the expence of creating, and putting out the manure.

* Rare indeed to be found, as I have experienced.

Dr.

74 Summer maintenance of Horned Cattle, &c.

Dr. Potatoe Planting in Field No. 19,

	l.	s.	d.
1770 To taking down, and dressing the back of the ditch at <i>one</i> end, 24 perches at 11d	1	2	0
To drawing out the dung	0	15	0
To Labourers planting the potatoes	1	2	6
To Cash for seed Potatoes	2	0	0
To Labourers weeding	0	2	6
To Do. digging 41 bar. 7 stone at 7d	1	4	1
	<hr/>		
	6	6	1
To net Profit	6	1	11
	<hr/>		
	£12	8	0
	<hr/>		

	l.	s.	d.
1770 To Ploughing and harrowing the com- post twice	0	5	2
To Labourers filling the manure	2	1	0
To 43 horses drawing out	2	3	0
To Labourers spreading the manure	1	1	8
To Bush-harrowing and rolling twice	0	4	3
	<hr/>		
	5	15	1
To net profit yet remaining	0	6	10
	<hr/>		
	£6	1	11
	<hr/>		

Summer maintenance of Horned Cattle, &c. 75

With a View to making Manure, &c. Cr.

	l.	s.	d.
1770 By Produce 41 barrels 7 stone at 6s.	12	8	0

£12 8 0

	l.	s.	d.
1770 By Gain in preparing the manure or compost	6	1	11

£6 1 11

Here we see the merit of this method of making manure in the field it is intended for. *six Shillings and ten pence* profit remaining by the preparation, even, after paying the expence of putting out 900 loads an acre, spreading and all other charges. I conceive this to be a prodigious thing to the farmer. But when we add to this consideration, the improvement of the fence, giving a drip to the falling rains to run off, and *for ever* enlarging our dimensions of the profitable ground, I trust I shall be justified in earnestly recommending this method to the practice of the farmer. I have now pursued it for three years, and have such abundant reason to be well pleased with it, that I shall every year enlarge my scale upon this plan.

I shall just observe, that where the fields are small, the quantity of compost will be almost inexhaustible, unless an adjoining field happens to be so circumstanced, as to be capable of receiving it, or in want of it, which will be the case, where the ditches belong to the next field or fields—I have some so circumstanced.—This is in case fields are small, but where they are large, it will be prudent to make the compost vastly richer, by a second or third mixture of dung, or other enriching bodies, as the compost must be laid the thinner, to reach over the whole field.

I shall now trace this field a little further, and shew some other improvements made in it, as I intend every year hereafter, to give it a place in my reports.

The land is of a stiff kind, holds the water, and was naturally wet;—when I began with it, poor to a great degree, full of loose stones, over a lime-stone quarry, near the surface, and many large stones hidden, which used to interrupt the plough: Those are removed, and by bold and strong tillage, frequently repeated, I now have a staple of twelve and eighteen inches deep; for I observe, by strong tillage, that in a course of years, the land swells surprizingly, even where no manure has been yet applied; but this field has increased

creased in depth of soil, by the united powers of tillage and manure.

On the north east side, the ditch was made a year or two before I took the farm; but it was not half sunk; I suppose it was some of the *cheap* task-work which I sometimes hear of, (the bane of perfection in every thing) and therefore the men could not think of encountering the stones.—By this means, the fence was nothing, only an apology for one, by the constant passage of cattle over it, wherever they pleased, it was in a manner filled up; and in short was next to no fence.—Consequently, here was no way for this and the adjoining field to discharge the water, which greatly annoyed them both.

I determined to remedy these evils.—I therefore set this ditch to be sunk *five* feet perpendicular in every part, at fifteen pence a perch, which I suppose was more than was originally given for it. The poor men really laboured hard, and executed their work completely—I kept an account of their time, by which I saw the price was not adequate to their labour, and therefore paid them *eighteen* pence a perch, and eight shillings for the stones they raised. The ditch was thirty-six perches long.

After this ditch was finished, I paid *eleven* pence a perch, for taking off the back, in the manner I described in my report last year; and now, I have every reason to be pleased with this piece of work, for I have a noble fence, which I think, when all the potatoe compost is taken away, will bid defiance to any hunter upon earth *without wings*.—And above all, by sinking so deep, it was surprizing to see all the winter, what a stream I had running in the ditch, by having cut across the veins (if I may so call them) of the springs.—But this summer, which is remarkably dry I cannot but look with particular pleasure at the ditch, and more particularly at the side next this field, to see it constantly wet, by the springs weeping out of our field No. 19, which used to be sick with water.

Besides

Besides this improvement, I scoured the ditch at the upper end, which used to be brim-full of water, almost winter and summer, and intend to sink it *five* feet perpendicular.—To take the water away, I was obliged to pursue the scouring one hundred and fifty perch; to sink other ditches one hundred and ten perch, and sunk through an hill thirty perch long, in some places fourteen feet deep, and now, where water never run before, this drowning of the land runs off—but these works will be proportioned to their boundaries upon every field, in my future accounts of them and their progress, upon the general plan which I have now laid down to pursue for the publick inspection, and I hope, information.—The proportion of scouring, to the field before us, cost me eleven shillings and six pence.

At one corner of the field, was an ingenious contrivance, as an occasional passage for *cars* and *cattle*, by pulling down, and making up the fence, with earth and stones.—This was made a frequent way by strolling foot passengers, wherever they pleased without mercy over this and the adjoining fields.—To stop this inconvenience, and to compleat my fence, I built a stone-wall in this place, which cost me, for lime, sand and workmanship, £1 11 6.—The stones, with some gathered off the field, built the wall.

I have also built a pair of piers, and hung a gate, in a very compleat manner to this field; and made a new sewer at the gate-way, of lime and stone, so that a man may go in to clean it.—I compute that every pair of piers, with the gate, irons, sewer, and flank walls, stand me in about five guineas.

I shall now restate the account of this field, in order to lay before the reader, the whole expence, that that he may be able to form a judgment as I go on with it hereafter, how far the produce of the land, year after year, will be able to defray the expences of such improvements as are already done, and to be done.—

Dr.

Dr. The Field No. 19. 4 acres, 2 rood, 10 perch upon the General Plan of its most *Perfect* improvement, thereby taking in every article of expence.

1770. To the total expence, as already stated			
in page 70	24	6	6
To sinking the North east ditch 36 perchs at 18d	2	14	0
To the stones raised out of ditto	0	8	0
To taking off the back of this ditch at 11d	1	13	0
To scouring another ditch	0	11	6
To building a wall of lime and stone	1	11	6
To a pair of piers, gate, sewer, &c.	5	13	9
	<hr/>		
Total expence	36	18	3
By total produce in the year 1770	36	17	5
	<hr/>		

Balance against the field upon the general account 0 0 10

Thus it appears, that after executing such very considerable works upon this field, as to amount to £36 18. 3, that it remains indebted to me, only *ten-pence*—Without enlarging upon it, I shall only observe, that the event of this enquiry confirms me in an opinion, which I have long retained, that £ 20 an acre (I am not clear that I might say £30) may be safely laid out upon land; provided, the money be *really* laid out, and, that the improver is not *too much* imposed upon.—The improvements made here, in the field before us, are *beautiful*, and *substantial*.—I find convenience and pleasure in them, and hope they will be animating to others, as I shall every year lay before the publick, the progress of this piece of ground; and also, introduce others, with an exact account of the expence and produce, since I find, it is fields in exhibition that must *persuade* the *bulk* of mankind; smaller experiments will inform the ingenious; those I shall also introduce, and carry on with the most minute exactness.

An Experiment on Potatoes.

I having lately, heard very much of the prolific nature of a new species of potatoe, called the apple-potatoe; and every day (I own, contrary to my former opinion) finding of how much consequence, potatoes are to the labouring people of this kingdom, I became desirous of obtaining some of this sort.

I endeavoured in vain, to procure a barrel of them, with an intention of planting them in the spring 1770.—However, on the 8th of *May*, a servant of mine procured two stone of them somewhere for me, for which I paid 2s. 2d.—On the 9th I planted them.

I had a small piece of ground in my orchard which had been dug in the preceding winter, intended for other purposes—this ground I chose.

The two stone of potatoes, were cut into as many pieces for seed, as they would admit of.—I planted *eighteen* rows with them *three* feet asunder, and the *sets*, twelve inches in the rows, and the rows were fifty feet long.

They came up very well, and flourished away at a great rate. I had the intervals once dug with spades, and the plants kept free from weeds, by twice weeding.

On the 9th of *November*, by carelessness, some of my swine got at them, and played wicked work amongst them.—On the 10th, I had them dug,—The produce was as follows.

	stone	lb.
The <i>first</i> row produced	4	13
The <i>second</i>	4	4
The <i>third</i>	4	10
	<hr/>	
	13	13
	<hr/>	

The

The average of each row, 4 stone 9 pounds.

The third row, as being nearest the average, I had separated into four sizes, in the following manner.

Of the largest	76 potatoes,	weight	3ft. 2½ lb.	Average
				per potatoe 9 oz. $\frac{1}{4}$
Of the next large	62 do.	do.	1 0½	do. 3 $\frac{3}{4}$
Of the next	42 do.	do.	0 4¾	do. 1 $\frac{3}{4}$
Small ones, which passed through the riddle * were 62				
potatoes, weight 3 lb. Average $\frac{3}{4}$				

This little table of produce affords great information, as to the value of this species of potatoe; for we see they are very large, with very few small ones, which is a great recommendation of this kind; whereas, most other kinds that I have had, are some, half small ones, and others a third, which is a great drawback upon their value.—Here we see, that we have only three pounds of small ones, out of four stone ten pounds, which is only one twenty-second part; a circumstance which makes me think very highly of this potatoe.

* When I entered spiritedly into the culture of potatoes, I found every stage of the business expensive; but that was unavoidable, and therefore I was reconciled to it.—But when the potatoes come to be “*picked*” as they call it, I lost all patience.—I was one year run to near 4 l. expence for picking potatoes, and my quantity, I am sure not 60 barrels.—It is the finest lazy work that can be conceived; men, women and children, all sitting, lying, kneeling, smoking, and chattering, without any regard to the business, but to NURSE it as long as they can.—I told them that year to make the most of it, for that I believed they would be the last potatoes that I would ever have picked.—Accordingly, against the next year, I got a large riddle made of very strong iron wire, the meshes one Inch $\frac{3}{4}$.—I set to work with this, a man and boy. I am sure they will do more in a day, than forty pickers.—The riddle cost me five shillings and five-pence, and I am persuaded has saved me twenty pounds since I had it.—But I find I must have a set of them of different sizes.

The whole eighteen rows, produced three barrels eighteen stone and six pounds; and I dare believe, the swine destroyed half a barrel.—However, what I did obtain, amounts to about one hundred and three barrels per acre.

We have already seen, that the small ones amounted to only one twenty-second part of the produce; which, in the proportion of one hundred and three barrels per acre, will be about four barrels thirteen stone two pounds and a half.—Let us state this.

	Bar.	St.	lb.
Gross produce as before ascertained, per acre	103	0	0
Deduct for small ones	4	13	2½
	98	6	11½

The remainder we see, is 98 barrels of merchantable potatoes, even though they were planted so late as the 9th of *May*.

I kept what I had of them this spring. I caused some of them to be boiled in a pot by themselves, and some other kinds in different pots; and had them put before my boys, for their sentiments upon their quality for eating. They all preferred the apple potatoe, although the other kinds were very good. I eat of them myself, and I found them surprizingly dry and mealy; and they appeared to me to be an hearty strong food, much beyond any other, that ever I eat of. But there was one circumstance, which struck me very strongly. When I went to the boys, to ask them which they liked best, one of them who is, and I believe ever will be a slovenly fellow, was powdered from the chin to the waste, as if meal had been thrown upon him, by his breaking the potatoes he eat of, and letting them crumble upon his cloaths; this is a striking proof of their prodigious *dryness*.

All

All these circumstances, induce me to look upon the *apple-potatoe*, as a great acquisition to the poor labourer, who ought to have every assistance that nature and ingenuity can furnish, to lessen his expence of living; but I apprehend, this potatoe will never be acceptable at the Gentleman's table, as they are strong, and very unsightly; but I am convinced, an *heartly* food, for a working man.

T H E E N D .

**A PLAN and description of a new constructed
GRANARY, for the preservation of
thrashed CORN.**

IN my Report for the year 1768, I furnished the publick with a Plan of a new constructed Barn, which I have the pleasure to hear, has been so well received by some Gentlemen, as that they have built Barns from that Plan.—From thence I am encouraged to fullfil my promise of a Plan for a new constructed Granary.

I shall not enter into a description of the offices which are generally built for Granaries ; their inconvenience, and injury of the Corn lodged in them, sufficiently bespeak their imperfection ; neither shall I say any thing of the utility, or inutility of Granaries in a national view.—No doubt, they are necessary offices to the Gentlemen and the farmer ; upon that I rest my justification for laying the following Plan before the publick.

The injuries to which Corn is liable in Granaries are many.—I shall name a few.—viz.—*Dampness, must, fermentation, sprouting, insects, and vermine.*—The *improper construction, and imperfect building, want of air, and occasional beat, and the vast expence which attends the giving the Corn frequent motion, which is necessary to its preservation, are the causes.*

The above injuries I propose to remove, by the latter remedies, in the construction of the Granary, which I now offer to the consideration of the publick, by which I do conceive, that corn may be kept as long as may be thought necessary or prudent, notwithstanding the moving of it, I apprehend, need be but seldom.

The dimensions which I have chosen for the present Plan, will be no rule to any man, who may be disposed to adopt my ideas of a building of this kind ;

as upon the same principles, it may be built upon any scale, which he may apprehend, will answer his purpose.

Fig. 1.—Is the ground Plan, and sufficiently explains itself in the plate.—And therefore, all that I have to observe upon it is, that I would have the walls built with the greatest care from the *first* stone, and most carefully grouted to the first story *at least*.—I would have the earth taken out of the area, as deep as the foundation, and fill the whole, with the smallest stones I could get, and then grout the whole, as long as it would take any mortar wash, and level all off quite fair.—Upon that plane, I would lay my joice for the ground floor, and level up to their surface with brick-work, perfectly well executed, and then grout with mortar finely sifted, to compleatly fill every crevice.—These precautions will I think keep out rats and mice.

As these joice will have thorough bearing, I think they need not be above 3 inches by 2 or $2\frac{1}{2}$.—I should choose them of *oak* for *this* floor, which is to be a level one.—

Fig. 2.—Exhibits one side of the building, and by the *eight* windows marked 2, shews, that there are to be *four* floors*, besides the *ground* floor. These windows are all to be neatly weather-boarded, and lined with very open *canvas*, to keep out birds, unless *wire* shall be preferred, which is certainly better.—The *fills* of these windows, are all to be placed immediately *upon the joice*.—The *inside* jams of these windows, are to have a neat frame, *two* feet high, the *breadth* of the windows, with some slips of *single* cut deal, about 3 inches deep, and 2 or $2\frac{1}{2}$ inches *asunder*, put in those frames perpendicularly, *edgeways*, with the sharp edges just taken off with a plane, and then lined with hair-cloth, for the corn to lie against, when the floor are full of grain.


* If I were to build a Granary, for the stowage of a great deal of Corn, I would put *six* floors, besides the ground floor.

Fig.

Fig. 3. A shews the joice, which are to be 18 feet long, in order to have 12 inches bearing upon the walls; and should be very carefully bedded, so as to lie *level*.—But if that *attention* should be given, I should wish to have them touch upon the walls only about 2 inches, and the wall to *bevel back* as far as the *ends* of the joice, about $\frac{1}{4}$ or $\frac{3}{4}$ of an inch, by which means, when the *weight* of work comes upon the *ends*, the joice will *buckle up* a little in the middle, and thereby form some small degree of an arch, which cannot fail I think, to add to their strength. I should choose these joice 12 inches deep, and $2\frac{1}{2}$ thick.—The upper edges must be shot with a long jointing plane, for a reason which will appear immediately.—B B are to confociate with, and become part of the joice, viz.—A piece 9 feet long, 12 inches deep, and $2\frac{1}{2}$ thick, is to be cut from *corner to corner*, and spliced upon the joice A, in the manner represented in the figure; the edges uniting the joice, being first shot with a plane, to make a fair and even joint, with the upper edge of the main joice A, which was before directed to be shot also.—Thus it appears, that each side of the floors, are to have an inclination of about 12 inches to their centre.—And I would have every joice, and the space *between* them, to occupy one foot; consequently, the spaces between the joice, will be $9\frac{1}{2}$ inches.

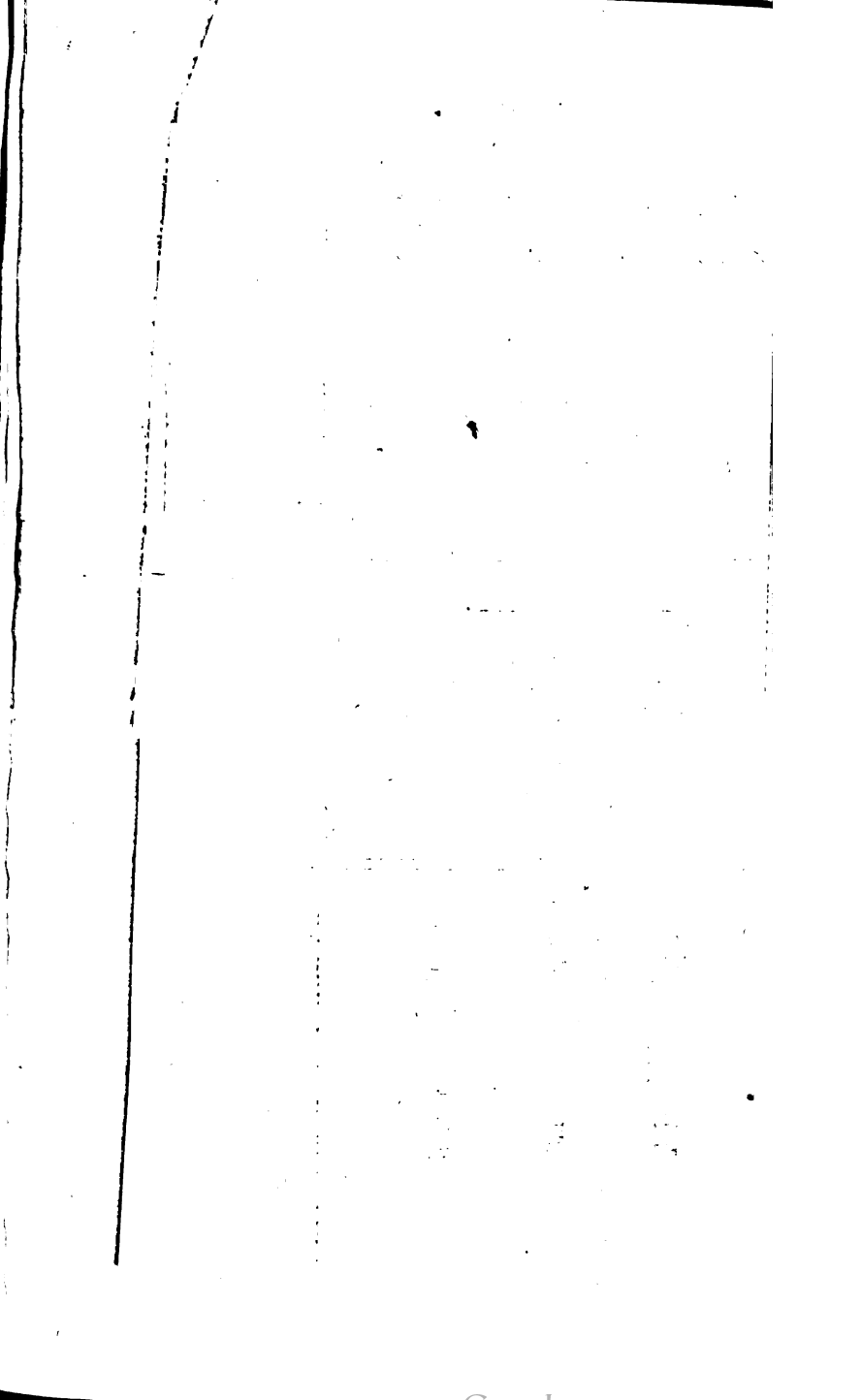
Fig. 4. A pair of joice. A A slips let down between a pair of joice, which should be 3 or 4 inches deep, and about $\frac{3}{4}$ thick, placed edgeways, 3 or $2\frac{1}{2}$ inches asunder, and their *upper* edges to be taken off, so as to make them a little round, to prevent their cutting the hair-cloth, with which they are to be covered, instead of boards. B B B B represent, that for a foot from the walls, this pair of joice are to be covered with a board, and the same from the centre of the floor, with a crevice in the centre C, between the joice, for a purpose hereafter to be mentioned, and this crevice is to run from end to end of each of the upper floors, where the corn is to lie.—D D are no more than the ends of the joice, which are to lie in the walls.

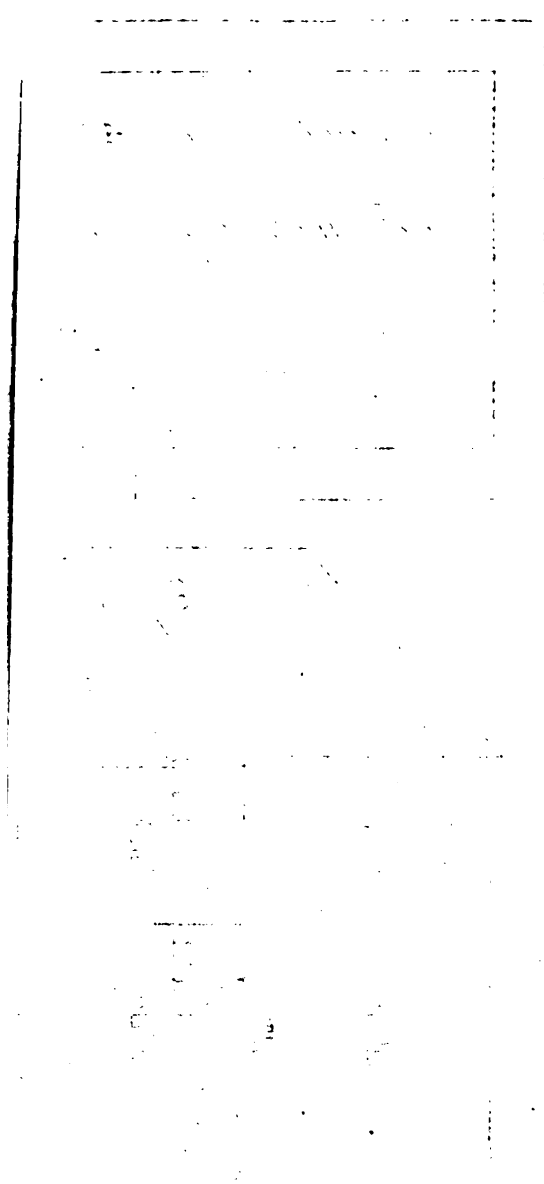
walls.—Every 5th joice is to match with the 6th in order to make a pair to be formed in the manner just described (fig. 4.) on one side the building, and every 5th and 6th on the other side, in the same manner, by which, these admissions for air *under* the corn, will intersect each other, and admit a great body of air.—But the front, Fig. 2. shews, that the air-holes to each pair of joice so covered with hair-cloth, are to be at only *one* end of one pair, and at the *other* end of the *other* pair; consequently, these air-holes marked 1 in fig. 2, will also intersect each other, from the two sides of the building. All the little seeming windows in the front marked 1 in fig. 2, are not intended for windows, but the air-holes just mentioned, and are to be *between* the joice only at *one* end of one pair, and at the other end of the *other* pair, covered with hair-cloth, in manner before mentioned. For these air-holes there must be little frames made, and weather boarded very neatly, with narrow slips.—And I should choose, that *between* the joice opposite these air-holes, should be filled with mason work 12 inches high, and beveled off from

thus,  *inside to outside* to the bottom of the air-holes, as

and neatly plastered; by this means, the joice will be firmly fixed, and the air will have free admission.—Thus, the *intention* appears, of admitting the air *under* the corn, which it will pass up through the hair-cloth, and through the corn.—This I conceive to be the grand preservation of corn from *must, beating, sprouting, or insects.*

Fig. 6. Is a tube, for the attraction of air through the corn—to be *five* feet long from A to B, *open* at the top, but *close* at the bottom; and made bevel in the bottom, to fit the bevel of the floor.—I would have it 18 inches broad, and 6 or 8 inches deep in the clear.—From A to C and D to E, to be covered with hair-cloth on each side.—By this means, I conceive the air will pass easier through the *deepest* part of the corn, than without these tubes.—The tubes are to be moveable—one of them is to be placed as the granary fills with grain, in the centre over each pair of joice which are covered with hair-cloth.—And directions should be given to the men who go into the granary to be careful





not to hurt them, by rough usage, as they will require but slight stuff.

Fig. 5. As the floors all incline to the centre, 12 inches in 9 feet, there will be no convenient walking place for men to take the corn to the furthering of the building. —And as the intention is, to have all the corn which goes into the granary, first lodged upon the *upper* floor : —I would have as many planks, about $2\frac{1}{2}$ inches thick, and 18 broad, as would reach from the landing place on the *upper* floor, to within 6 feet of the further end of the loft, to be laid occasionally along the middle of the upper floor when corn is coming *in*, and always to be kept in this loft; but I would have them in distinct pieces, of not less than *five*, nor more than *six* feet long, by which means, as the farther end of the loft shall be filled with grain, a plank will be taken up, and then fill to the next, then take that up, and so on. —*Under* each end of these planks, a block, as represented in figure 5 is to be spiked on, in order to lie compleatly to the bevel of the floor, and as the sack lands from the pully to the landing place of this floor, a man whips the barrow fig. 7, under it, and trundles away the barrow to the other end along the planks just described, starts the corn, and comes back again to receive the next sack, and throw down the empty one.

Fig. 2. The two windows to the ground floor, marked 3, are to be glazed, merely to give light, as the intention is, for no corn to be kept upon that floor for any time.

At one end of the building, the floor must be level for about 4 feet in each floor, and a little partition about three feet high at each end, and about four in the middle, with a pair of folding doors about four feet wide, to admit the barrow and sacks in the upper floor, and in the lower ones for the passage up, and into each floor or room.—When the upper floor is full, the doors to be shut, and the corn leveled in its surface.—But as the corn is taking in, let it not be forgot, to place the tubes fig. 6, in their respective places.—To these tubes fig. 6, for the three under floors, it will be necessary to have some kind of cover, as F fig. 6.
G hung

hung by a little hinge, to cover the tubes, when the corn is to be let run from one floor to another, otherwise, they will fill with corn, which would destroy their intention.

In the centre of each landing place to each floor, must be a pair of trap doors, to admit the sack and people up and down.—And there must be a pully erected to work to the *upper* floor only; and it may be made to in that, or the ground floor as may be most agreeable,

Under each floor, and *between* every pair of joice, there must be a little slider neatly fixed, to draw backwards and forwards, under the crevice C in fig. 4.—When the upper floor is to be filled with corn, these sliders must all be shut,—and, when the corn is to let down to the next floor, the sliders must all be drawn back, and from the *bevel* of the floor on each side, the corn will pass down in one thin sheet through the crevice C in fig. 4.—The same operation will move the corn from one floor to another, from top to bottom, so that the upper floor full of corn, will get four of these motions, before any labour will be wanting to get it up again by the pully.—Here we find the use of the inclination of the floors from each side to the centre, as described in fig. 4.

I would have the entrance into this granary at one end of the building, provided only one kind of grain is to be kept in it; and a pair of scales hung on the ground floor, for weighing off all corn that comes in, and all that goes out—but no great quantity of corn should be kept upon the ground floor, that should be *free* for the reception of the corn, as it comes down from floor to floor.—The bottom of the door of entrance, should be lined with plate iron, to prevent vermine gnawing, and if the sill is not of stone, let it be also plated.

In boarding all the upper floors, I should recommend their being done with feather-edged boards—i. e. the lower edge $\frac{1}{2}$ thick, and the upper $\frac{1}{4}$ or $\frac{3}{8}$ only, letting the thick edge *lap* sufficiently over the thin one.—The corn will run down easier in that case, than were the boards

boards all even—But let a birch broom be kept in each floor, in case any grains stick any where, a little touch of the broom will set all in motion.

All the places where hair-cloth is nailed on, the margins where the nails are drove, must have a slip of leather, which should be *bazil*, and on no account *alum'd* leather, as that will soon rust the nails.

The whole building must be neatly plattered from top to bottom.—In the setting out, I guarded against vermin working through the walls, or ground floor.—To prevent their creeping up the walls to the windows, or air holes, let the building be well stocced on the outside, all round from the bottom of the lower windows to the bottom of the first row of air holes.

To each floor in each gable, I would have a large window glazed, to give full light.—

I think in this granary, the corn may safely lie two feet thick on each side, consequently it will be *three* feet thick in the middle.

If at any time in a long-continuance of damp weather in winter, the proprietor should wish to convey any heat to the corn, let a stove be brought to the ground floor, under the trap-holes, let them all be opened—and a good fire made of *Kilkenny* or *Cbarcoal* for two or three days.—And if any insects *should* happen to be in the corn, which I much doubt, let all the windows be stopped, and small quantities of brimstone thrown upon the fire, so as to fill the whole building with its fumes, and that will soon destroy them.



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34

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